

RECORD



F. R. Fosberg

Berg

Berne



Field and Collection Note Book

No. 57

(May 15, 1960 - Sept. 4, 1960)

(40841 -- 41204)

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F. R. Fosberg

Dr. Fosberg

# Landeskarte der Schweiz Carte nationale de la Suisse 1:50 000

Kartenzusammensetzung mit Relieftönung  
 Assemblage avec teintes relief

## Genève Blatt Feuille 270



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1958





# OLORON-S<sup>te</sup>-MARIE

et ses Vallées

(Basses-Pyrénées)

FRANCE



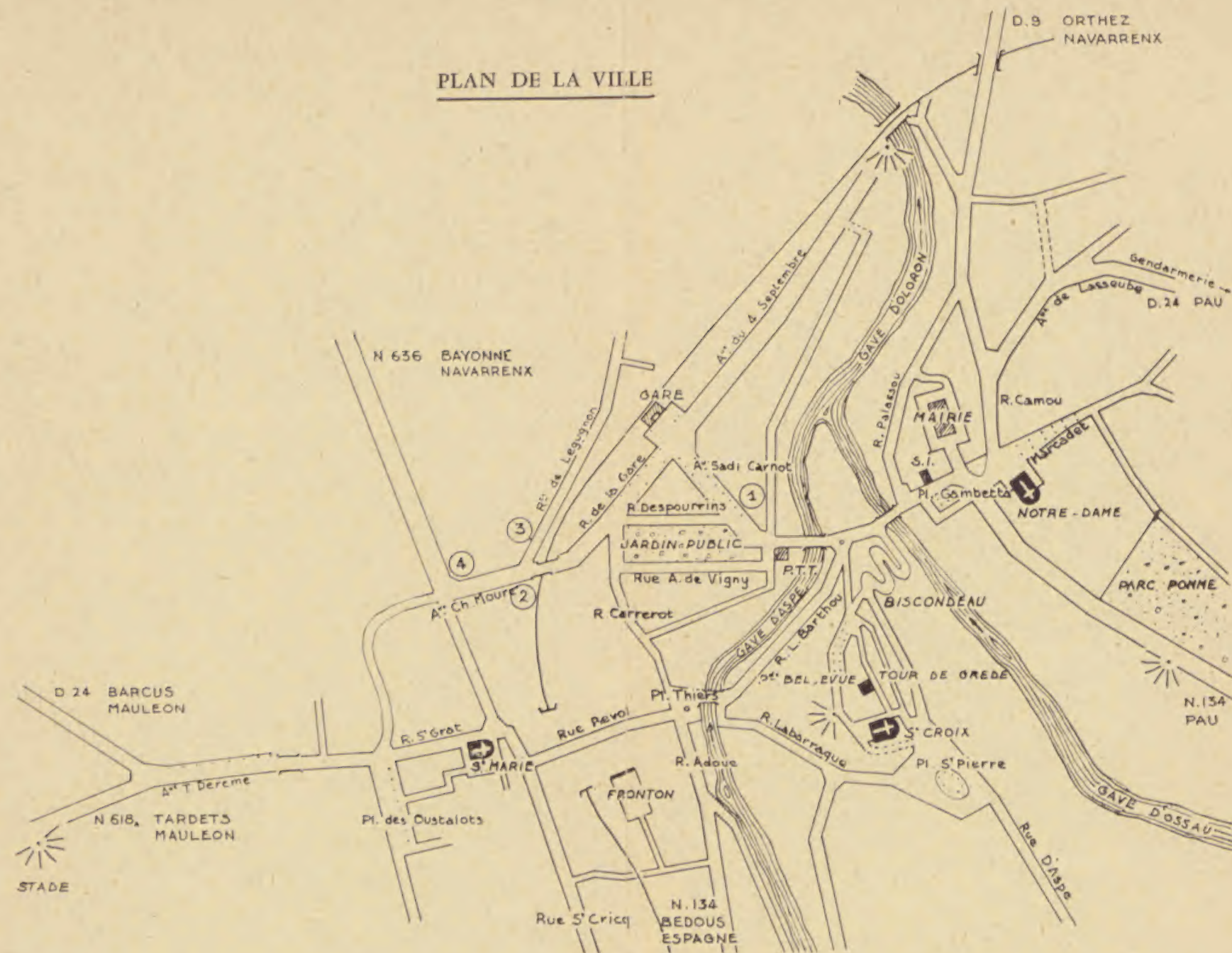
PORTAIL SAINTE-MARIE

EDITE PAR LE  
 SYNDICAT D'INITIATIVES

7, Place de la Résistance - Tél. 196



## PLAN DE LA VILLE



## VISITE de la VILLE

La ville se compose de trois quartiers séparés par les gaves d'Aspe, d'Ossau et d'Oléron (réunion des deux premiers).

**Quartier Sainte-Marie :** A l'Ouest du gave d'Aspe. Cathédrale du XII<sup>e</sup> siècle avec son magnifique porche et son trésor. Le Stade municipal (vue sur Oloron-Sainte-Croix, sur les Pyrénées et le pic d'Anie (2.500 m) et son terrain de camping. Jardin Public.

**Quartier Sainte-Croix :** Le vieil Oloron (Illuro) entre les gaves d'Aspe et d'Ossau. Eglise du X<sup>e</sup> siècle; sa tour de Grède; ses vieux immeubles. Promenade « Bellevue » (vue d'ensemble unique sur la ville et les Pyrénées). La rampe du Bisconneau.

**Quartier Notre-Dame :** L'Est du gave d'Ossau, la Mairie, le parc Pommé. La route de Pau (vue sur le vieil Illuro et le Bisconneau).

## DISTRACTIONS

**En toutes saisons :** Rugby, athlétisme, foot-ball, boules, spéléologie, sports régionaux : pelote, quilles de 9. Région spécialement réputée pour la pêche à la truite, au saumon. Chasse : palombes, isards, sangliers et battues à l'ours.

**En hiver :** Ski. Gourette (3 remonte-pentes). Peyranère, Aneu. - **En été :** Camping au Stade municipal, canoë, tennis. Fêtes : en juillet, fêtes d'Oloron; juin, août, octobre, fêtes de quartiers. Foires : le 1<sup>er</sup> mai et 8 septembre. Pèlerinage de Sarrance, le 1<sup>er</sup> dimanche de septembre. Junte de Roncal, le 13 juillet, départ d'Arette, route de Guiers.

# OLORON-S<sup>te</sup>-MARIE

et ses Vallées

(Basses-Pyrénées)

FRANCE



PORTAIL SAINTE-MARIE



ÉGLISE SAINTE-CROIX

# OLORON-S<sup>te</sup>-MARIE

## ET SES VALLEES

230 m.

(Basses-Pyrénées)

EDITE PAR LE  
SYNDICAT D'INITIATIVES

7, Place de la Résistance - Tél. 196





SAINTE-CROIX vu de SAINTE-MARIE



SAINTE-MARIE vu de SAINTE-CROIX

## HISTOIRE DE LA VILLE

Les origines d'Oloron remontent à l'époque romaine.

La ville abandonnée après deux invasions, par les Vascons (IV<sup>e</sup> siècle) et les Arabes (VIII<sup>e</sup> siècle) fut relevée par ses évêques. Centulle IV, vicomte de Béarn, en éleva une seconde en face. Du IV<sup>e</sup> siècle à 1790, Oloron fut le siège d'un évêché. Soixante et un prélats se succédèrent à cet évêché, depuis St-Grat que les mémoires appellent « un artiste brillant » de l'église gallicane en lui donnant le titre de « Père des Pauvres » jusqu'à Villoutrex de Faye. Elle fut même de par son importance et de par sa population le siège du département pendant quelques jours. Mais Pau ayant intrigué et fait agir ses mandataires auprès du Conseil des Cinq Cents « les Anciens » affectèrent à Pau, le siège de l'administration. La loi du 28 pluviôse an VIII en fit une sous-préfecture.



VILLAGE D'ARETTE



TARDETS (LE FRONTON)



VILLAGE ET CIRQUE DE LESCUN

## Les vallées



LES EAUX-BONNES (VUE GÉNÉRALE)



LE PIC DU MIDI D'OSSE

## A TRAVERS LES VALLÉES

**Vallée d'Aspe :** Vers l'Espagne par le col du Somport : Saint-Christau-Lurbe, station thermale (maladie de la peau), parc, lac, excursion facile du Mail Arrouy : 2 heures (magnifique vue sur Oloron et la région). Sarrance, lieu de pèlerinage. Lescun (31 km) au centre d'un cirque de montagnes, nombreuses excursions (Pics d'Anie, Ansabère, lac de Llurs etc...). Fort du Pourtalet et chemin de la Mature à 40 km. Peyranère à 49 km : champs de ski et vue magnifique sur le massif d'Aspe.

**Vallée d'Ossau :** Vers l'Espagne par le col du Pourtalet (60 km) Ogeu : eau minérale réputée, Buzy : dolmens à la sortie du village. Bielle et Laruns : vieilles maisons, centre d'excursions. Eaux-Chaudes : station thermale et Eaux-Bonnes : station thermale (os, gorges, poumons) sur la route du col d'Aubisque. Barrage et lacs de Fabrèges et d'Artouste (Téléférique).

**Vallée de Baretois :** Aramits : vieux châteaux. Arette (à 20 km) : junte de Roncal, gouffre Loubens, centre d'excursions.

**Vallée de Haute-Soule :** Tardets et Licq-Athery, jolis paysages basques - Nombreuses excursions, Saint-Engrace (Gorges de Kakouetta, Eglise classée) - Larrau (Gorges d'Holçarte - Pic d'Orhy).

**Vallée de Josbaigt :** Vers Bayonne et la mer, à 100 km. Navarrenx (20 km), vieille ville et remparts. Jolies perspectives sur les Pyrénées.



NOTRE-DAME

**Spécialités gastronomiques :** Confits d'oie et canard. Palombes. Truites. Saumons. Fromages de brebis réputés. Vins célèbres de Jurançon, Monein et Lasseube.

**Productions locales :** Chocolat, meubles, bois, chaussures, cuirs et surtout bérêts, sandales et couvertures.



BLATTEINTEILUNG  
TABLEAU DES FEUILLES

Carte nationale de la Suisse 1:500000

Landeskarte der Schweiz 1:500000



EGLISE SAINTE-CROIX

# OLORON-S<sup>TE</sup>-MARIE

## ET SES VALLÉES

230 m.

(Basses-Pyrénées)

Blätter in Vorbereitung  
Feuilles en préparation

F. R. Fosberg

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begin with #40841  
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1940 France

1

3

May 15 - trip by rail

Paris - Limoges - Toulouse.

Fields mostly beautifully green south of Paris.

Thickets on m. cuts and in ravines, etc. s. of Paris

mostly dominated by

Robinia, Crataegus and

Laburnum, all in full

bloom. Aesculus ~~sp~~ and

apples(?) in bloom. Viscum ~~sp~~

in Robinia(?). Sambucus <sup>nigra</sup> in bloom.

Waste places with

Galium mollugo, Papaver,

Rumex acetosella, Vicia,

Cruciferae flowering conspicuously,

45 minutes out of Paris the

country is very open, no

hedges, few trees, intensively

cultivated, large fields.

This to Chevilly, about 107 km. in

s. of Paris. Then a more

usual pattern of hedges,

patches of woods, trees along

roads, etc.

Woods have Quercus, Robinia,

~~Aesculus~~ Aesculus,

9:40 Orleans

Between Orleans and Vierzon

are considerable areas of

a complex of heath, gorse, birch,

pine and thickets. Three ponds

with Nymphalids. Much sand.



South, a little before Chateauroux are considerable very dense woodlots and cultivated fields, the cultivated areas spotted with patches of thicket, which may represent sink-holes, though this is not clear, as the holes cannot be seen through the dense scrub. One or two close to the r.r. seem to have depressions.

Just before Chateauroux in a pond close to the track was a *Nymphaea* (?) with small yellow emerged flowers.

10:50

Chateauroux

12:40

Limoges

sub. rates

South of Limoges a great part of the trees look as though they had been hit by a late frost, after their leaves had started to emerge, and then, after being frozen back, had started again to leaf out. This could, of course, be the result of a disease, but it seems that more than one species is affected. It may even be that these species are just starting to leaf out, but this seems scarcely likely.

In hills somewhat south of this, epiphytes are abundant -

suggesting considerable fog. Mistletoe on poplar and oak(?).

Many of the trees show a columnar form and an abundance of small lateral branches. Judging by some that are freshly trimmed this is the result of pruning to bare trunks except for the top 1-3 m.

Hills well south of St. Germain les Delles, before Uzerche, have considerable birch and some Calena. *Cytisus*, *Genista*, *Ulex* common. *Cistaceae*. *Cytisus* + *Genista* in full flower.

*Chrysanthemum leucanthemum* abundant on r.r. cuts, and open weedy spots in general - perhaps not in extreme pioneer places but certainly in earlier, herbaceous, stages of succession.

From Limoges south the country has been low hilly (rougher than most Va. piedmont)

1:35

Uzerche

*Hedera* on rocky road cuts, also an erect fern - perhaps *Athyrium*. *Myosotis*.

Prominent ravines with steep walls.



North of Allassac <sup>(F.S.P.)</sup> a stretch of spectacular rugged scenery. <sup>(about km. 440)</sup> Apparently much slate mined near Allassac south of here. *Pteridium* very prominent in more open forests and in waste spots. Not fully unrolled.

2118

Brive Country south of Brive hilly, of a coarsely bedded sandstone.

The frosted appearance of the forest is also notable here, esp. at lower levels in ~~the~~ the canyons - in fact, the transition upward to fully leaved-out forest is abrupt.

*Robinia* continues to be very prominent on broken places, esp. r. cuts, etc.

*L. livinac*. Cereanar some badly grazed hills have scattered *Juniperus communis*.

From here south limestone is at least very prominent and dry open slopes with *Juniperus* are frequent, at least to ~~well~~ south of Cahors. South of Cascade the country flattens out and becomes rolling rather than hilly. Valley of R. Aveyron.

The effects of frost on the forest are conspicuous at least to Cahors, and the ~~cost~~ damage continues to be especially noticeable in the low spots and bottoms of valleys.

Aveyron valley, proper, is very flat, largely planted to vineyards, some orchards, esp. peaches.

Tree lined roads are prominent. Some hedges. Some meadows, pastures and field cultivation.

*Robinia* and *Sambucus* still in flower this far south but not *Crataegus*.

The flat plain of the Aveyron is not separated from that of the Garonne. Montauban.

4:45

Well south of the Garonne the landscape becomes rolling - hilly again, though the r. follows a flat flood-plain, evidently that of the L. Agout. Much grain raised here, some orchards.

Prof. Gausser says there was a severe frost May 1.



1960 France

May 13 - trip by bus to  
Pyrenees s.e. of Toulouse.  
Poppy fields.

14 km. before Limoux -  
mosaic of fields, vineyards,  
a few patches of woods and pasture  
on rolling-hilly ground, gray  
soil, the snowy Pyrenees in  
the background. (1st 4 loads  
incl. wheat with poppies)

After Limoux the cultivation  
gradually gives way to garigue  
and then to forest, as one follows  
road to Arques. Then as the  
mountains become rougher  
forest, esp. of pines (Austrian) becomes  
dominant (planted). Beech  
comes in beneath near the  
forest headquarters of l'Estagnol.

The pine seems to be functioning  
as a nurse tree for various  
broad-leaf species in addition  
to the beech.

This area was badly eroded  
garigue when the reforestation  
was started, something like 100 years ago.  
The landscape is entirely changed.

1 km. of contrast east of Arques.  
No of garigue. several b. = w.  
of garigue.

This is a very degraded  
formation. *Linum catharticum*  
& *Aphyllanthus monspeliensis*

abundant and conspicuous  
flowering. *Buxus* & *Juniperus*  
are the dominant shrubs.  
*Dorichnium suffruticosum*.

Hills around Quillan  
covered by garigue with  
patches of grass, esp. on  
ridges and patches of  
small forest - oaks, conifers.  
Some bare limestone cliffs.

Photos (b.w. & c. 2 ea.) from high  
pass, scrub on limestone  
and valley of route toward Quillan

*Coriaria myrtifolia* on  
road cuts.

Boq - Troubiere de Pinet

A flat in a depression  
surrounded by hills -  
covered by a dwarf scrub  
of *Calluna*, dense & broken by  
patches of sphagnum and  
*Eriophorum* <sup>*Wollastonia*</sup> mostly covered  
by an open stand of *Pinus*  
*uncinata*, but more or  
less open in center, here  
with dwarfed pines. A few  
*Betula* & *Abies* around periphery.

*Pinus* from almost touching  
to well separated.

Hills around flat with  
*Abies pectinata*.

A number of b.w. photos & several  
spiderwebmen.



High slopes a mosaic  
of Fagus, Abies, grass, grass  
with scattered *Cytisus scoparius*  
+ *Juniperus* scrub, heavily grazed.

Higher slopes above timber  
line. grass with snow  
patches. High peaks very snowy.  
Photos at Col de Chisoula.

Beech forest with many  
herbs. Helleboms, Dactylis,  
*Symphoricarpos*, *Asperula*,  
*Anemone*.

Vallee d'Arrege - photos  
of *Danthonia* in *Cytisus* scrub.

Below Ax. L. Thermo steep valley  
walls, densely wooded.

Lower slopes. Farther down  
the slopes are less steep,  
north slope is ~~the~~ cleared and terraced,  
in grass, largely, south  
slope wooded.

Farther on, flat land  
mostly in wheat, rye &  
potatoes.

Lower hills, above pass,  
covered by low scrub or dwarf  
scrub of *Buxus*, etc. gentler  
slopes cultivated.



Labeled  
typed

May 18 - Tourbiere de Pinet

in boggy ~~open~~ open pine forest  
with low shrub layer of Calluna.

40841

*Eriophorum*  
common

42

*Pinus uncinata*  
dominant

43

*Abies pectinata*

occasional around margins of

44

*Calluna vulgaris*

abundant

45

*Pinus uncinata*

dominant

46

*Betula alba* var. *vernica*

occasional in edges of

May 18 Col de Chioula, about  
~~10~~ 10 km - les Thermes

In dense Fagus forest

47

*Dryopteris*

on rocks

48

*Viola canina*?

common in grassy margins of

49

*Anemone nemorosa*

common in grassy openings

50

*Dentaria pinnata*

common

51

*Symphytum tuberosum*

occasional

52

*Fagus sylvatica*

dominant

53

*Asperula*

common in margins of

caespitose.

tree 5 m. tall.

tree 12 m. tall, sterile.

shrub 0.5 m. tall

tree 7 m. tall

tree 10 m. tall, trunk  
very rough below.

Auzige

herbs prostrate

flower violet.

rhizome buried, brown.

flowers white, turning  
lavender.

flowers dull yellow

flowers white.



May 22 - Trip by bus (International Phytosociological Excursion)  
Toulouse - St. Gaudens.

Garonne valley - very flat, terraces well-marked, intensively cultivated - vines, maize, wheat, oats, potatoes, *Vicia faba*, a few small pastures, a very few tiny patches of woods, mostly a coppice of *Robinia*, and a very few small patches of waste land in *Cytisus* or something similar (landes?).

Trees around houses, scattered along roads, some hedges but these not a prominent feature of the landscape.

Valley narrows abruptly beyond Montreuil, low wooded hills on both sides.

Beyond St. Montary the valley widens again, but is less flat.

St. Gaudens - Tarbes.

Flat valley continues, pasture more prevalent, hills and pastures with hedges and patches of wood.

bet. Montarejan and Lannemezan some patches of other forest, also of *Ulex nanus*. Pasture and

hedges usual. More trees in landscape. *Quercus pedunculata* common, largely planted.

bet. Lannemezan and Capvern we examined closely a "lande" - an open rolling area dominated by *Ulex nanus*, but with *Calluna*, some scattered *Salix* (1 m. tall or less) & *Rubus*.

The whole is a dwarf scrub in my sense. Some grassy spots, a little grass generally mixed in. Some *Erica*, *Carex*, *Campanula*, *Potentilla*.

*Mollinia caerulea* is the grass

- ♂ *Genista anglica*
- a *Ulex nanus*
- a *Mollinia caerulea*
- ~ *Campanula*
- ~ *Campanula* ~~pinata~~ *tormentosa*
- o *Potentilla tormentilla*
- o-s *Carex binervata*
- c *Erica tetralix*
- c-ls *Calluna vulgaris*
- c *Salix caprea*
- l *Betula verrucosa*
- xo *Rhamnus frangula* (l. *referta*)
- l *Populus tremula*
- ~ *Avena sulcata*
- l *Salix atrocinerea*
- c *Rubus*
- l *Pteridium aquilinum*



*Betula verrucosa*  
*Cornus sanguinea*  
*Crataegus oxyacantha*  
*Salix* sp.  
*Rosa*  
*Rhamnus frangula*  
*Rubus*

starting to form thickets.

In drainage channels  
*Molinia* is dominant,  
 with some admixture of a  
*Juncus* (cf. *bulbosus*)

The ~~scrub~~ scrub varies to  
 a mixture of dense grass  
 and dwarf scrub, with  
*Luzula*, but this rare. *L. pediformis*!

Locally *Pteridium* is  
 abundant, with grass  
 and scattered *Ulex* + *Calluna*.

*Salix*  
*typical*

May 22 - 1.5 km. e. Capvern,  
 w. of Lannemezan  
 open treeless "lande"

40954

*Luzula*

rare in grassy patches *Ulex* rare scrub

55

*Galium verum*

common in burned over lands  
 dominated by *Pteridium*.

56

*Cornus sanguinea*

forming small thickets  
 with *Crataegus*, *Salix*, *Rhamnus*  
 etc. in dwarf scrub of *Ulex nanus*.

1. 10. 10.  
 photo.

across the road *Pteridium*  
*aquilinum* is dominant,  
 with thin grass and  
 burned stems of *Ulex*,  
*Rubus*, etc. and a considerably  
 different herb flora, *Galium*, etc.  
 here rather weedy.

Said to be on rather richer  
 soil with lower water table  
 than where dominated by  
*Ulex*.

Deep ravine toward Capvern  
 densely wooded.

Hts Pyrenees

erect

flowers greenish yellow.

shrub 2 m. tall; flowers  
 white.



Bet. Capvern & Tarbes  
is a broad rolling valley  
with woods, thickets, hedges,  
pastures, small  
vineyards & cult. fields.  
forming a varied mosaic  
many meadows with  
conspicuous flowering  
herbs - Ranunculus, Campanula  
ornum, Trifolium, Orchis,  
etc. Crepis. Mowed for hay.  
Castanea planted and  
subspontaneous.

Salix, Alnus, Fraxinus  
in ravine bottoms, some  
Quercus on sides.

Betula nemuosa where  
there is sun, water & sand.

Robinia generally  
abundant in most thickets  
and wooded situations.

Tarbes - Lourdes

Flat, generally agricultural  
land. Low wooded or  
semi-wooded hills in  
distance on both sides.

Become more rolling and  
even hilly toward Lourdes,  
which is definitely in the  
foothills of the Pyrenees.

Hills wooded. rolling valley  
land cultivated. Some hills  
cleared and in pasture.

Lourdes to St. Christau.

West of Lourdes - hills  
with patches of woods,  
mostly Alnus, Pteridium,  
etc. being colonized by  
Robinia. On more gently  
sloping places cultivation.  
Forest is oak, chestnut, Tilia,  
etc., locally open, mostly  
dense.

Beyond Bethoven - flat  
agricultural land, meadows  
with hedges, small patches  
of woods, trees in the hedges.  
Terraces along river. Postelle.  
Turned left, again, toward  
Pyrenees, up over higher  
terraces, country still  
rather flat, but terraced.  
Asson. Scenery to left  
spectacular. Abrupt  
mountains and deep canyon.  
More broad terraces with  
meadows and cultivation,  
somewhat dissected,  
changing to rolling hills.  
Beyond Bruges the hills  
are are higher, mostly  
pasture, with hedges  
and patches of woods,  
wooded ravine bottoms.  
(Superficially much like  
foothills of Smokies in N.C.)  
Beyond Arudy. Toward



St. Christan, the terrain becomes rough. Limestone. Steeper slopes densely wooded with *quercus*, etc. Then large dissected alluvial fan. Ravines wooded. flatter ground in pasture.

Borde Bojer - naturally a beech forest but with many ~~exotic~~ trees - *quercus rubra*, *Liriodendron*, *Pseudotsuga*, *Abies*, etc.

Road climbs rapidly.

From Osas (St. Christan) the road follows valley of Arpe directly up into the Pyrenees. Steep slopes mostly wooded, some in pasture or *Pteridium*.

Steep sparsely brushy limestone cliffs here and there. (*Buxus*). Gentler slopes and valley bottom in pasture.

Some steep pastured slopes have ~~horizontal~~ <sup>horizontal</sup> bedges, apparently to retard erosion.

*Salix* spp. incl. *S. rosmarinifolia* in canyon bottoms.

Some rather striking talus at foot of cliffs.

Cliffs become more numerous, are no longer limestone above Borde. Place where they changed not noted. These look like granite or gneiss or schist. Some limestone still. *Saxifraga longifolia* very striking on bare cliffs. Near Archa cliffs mostly limestone again.

Upper forests in valley <sup>above 1000 m</sup> of Arpe seem to be *Fagus*. *Buxus* abundant in upper parts (1072 m). Near timberline an irregular belt of *Pinus uncinata* mixed with the *Fagus*. Heavy snow still on high peaks and slopes.

Rock above about 1100 m seems to be a schist or shale.

*Abies* in high canyons.

The *Fagus* at high altitudes shows a marked tendency toward twisted stems - banded and even smaller trunks.

Cliffs are limestone again.

Trees thin out to almost nothing on some slopes, still a forest on others near top of Col. Many sheep. Red schist near top.



Magnificent serrate  
snowy crest west of Col.

*Rhododendron ferrugineum*  
on north exposures.

Actually very little forest  
above pass, a little ~~scrub~~ scrub.

Here the vegetation  
is a turf ~~and~~ in the  
depressions in the red  
schist - *Antennaria*,  
*Primula*, *Gentiana*,  
many other compact herbs,  
many flowering. Occasional  
prostrate *juniperus communis*

Photos - 4-5 Kod. 1 b+w.

going down from Col  
a dwarf scrub of *juniperus*  
*Calluna*, *Erica* (L.), etc.  
is general, alternating  
in places with bare  
red schist or low  
grass turf.

A little lower, by ~~country~~  
military school, grass is  
general, very heavily  
grazed. ~~scrub~~ <sup>(bushes)</sup> only on  
very steep rock. A few  
scattered trees - *Pinus*  
*uncinata*, also on steep rocks  
with east exposure, and  
on talus - this on limestone.  
~~the~~ sparse *Buxus* scrub  
also on limestone talus.

On cliffs across canyon  
*Pinus* is more abundant.  
*Buxus* scrub ~~is~~ becomes  
abundant a little lower -  
said to be not eaten by  
sheep, to be toxic to them.

*Pinus sylvestris* comes in  
with *P. uncinata* on  
steep slopes a bit lower,  
on alluvium largely  
schist.

A little *Fagus* on steep  
slopes.

Level of *Buxus* but  
with some other things  
becomes dominant -  
some patches of small pine.



Gradually changes to sparse scrubby forest mixed with scrub as Canfranc is approached. Around Canfranc this is largely pine, some larch, ~~the~~ the trees below 2200 m. said to have been planted. Planting done to prevent avalanches.

Walls of canyon below Canfranc of a bedded rock, probably at least partly limey, covered by a complex of sparse scrub, dense scrub, and small patches of pine forest. *Populus*, *Salix*, in canyon bottom.

Lower the scrub is largely *Quercus ilex*, but mixed with many things, esp. *Buxus*, *Genista scopulina*, *Thymus vulgaris*. On gentler slopes *Buxus* forms an open scrub. On left side a dense forest on steep slope mostly *Pinus sylvestris* prob. planted.

Lower down the scrub becomes more mixed, esp. with *Genista*. Mostly an open dwarf scrub.

May 23 - Jaca to Ordessa  
Cultivated valley east of Jaca - coarse alluvium - principal trees *Populus* & *Salix*. Hills covered by dwarf scrub. Peña de Ornel - cliffs bare, upper ridge wooded with *Abies* & *Fagus* except western end which is bare. Lower slopes covered by *Pinus sylvestris*. Farther east cultivation <sup>overgrows</sup> gives way to "landes" of various *Genista* etc. incl. *G. horrida*, <sup>*G. horrida*</sup> also *Buxus*. A dwarf scrub, largely almost closed.

Terrible erosion in the alluvium and shale of the valley bottom. Eroded surfaces covered by sparse dwarf scrub.

Several terraces, each with some flat, uneroded land, which is cult.

Rio Aurin has a braided gravelly bed with varied sparse scrub.

Valley running north is mostly cultivated, with scrubby slopes on w. side. Cultivation on east slope. Fields held by hedges.



24 km

2 km below Esquer

Rio Gallego below Biercas

break-off  
slope  
of  
alluvial  
terrace

1 km  
inside  
& outside

partly  
made  
below

1st stop. - a small oak forest  
on a steep east-facing slope.  
The trees, *Quercus pubescens*,  
1-4 m. apart, about 3 m. tall,  
mostly more or less pollarded,  
trunks 3-25 cm. dbh. canopy  
almost closed. Low moss  
on trunks. Shrub layer  
almost lacking, a few  
scattered *Buxus* 1-1.5 m. tall.  
Herb layer continuous 2 dm. +  
with *Lithospermum* (?), most  
*Lithospermum*, a abundant.

*Lithospermum purpureo-coccineum*

*Carex halleriana*

*Cytisus sessilifolius* forms  
a weak 2-4 m. story of  
suppressed *Quercus*. very sparse.

On alluvial slope below  
is an open scrub of *Buxus*  
*sempervirens*, *Berberis vulgaris*,  
*Genista scorpius*, *Lactuca*, Rose  
Sparse layer of *Thymus*  
and other herbs, some open  
scrub.

The shrubs range from 4-20 dm  
averaging 7-10.

*Leanthemum - rumicoides*  
*subsp. pyrenaicum*

Spain

25

Valley east of Biercas -  
bottom cult. small fields  
separated by stone walls  
and hedges. Lower slopes also -  
gently sloping. Steeper  
slopes on south side a dense  
forest of *Pinus*, locally varied  
by patches of deciduous trees.  
North side bushy but  
not seen well. - *Genista*  
and *Buxus*, etc. scattered pine.

Two terrace levels in  
valley bottom, connected  
by deep ravine with  
sides partly eroded,  
partly pine forest on  
south side, scrub on north.  
Ravine perhaps 1 km. long.

Pine fairly continuous on  
s. side, on north a mosaic  
of scrub, scrub with scattered  
pines, thin oak forest, pine  
forest (in side ravines).

Farther up the flat valley  
bottom disappears, leaving  
only a gravel wash between  
very steep pine covered walls.  
Pine much sparser on north  
side. Mixed with *Buxus* scrub.  
Pine strongly parasitized by  
*Vesum album*.

Scattered *Fagus* toward  
head of valley. Mixed in  
ravines with *Quercus*, *Abies*.



Road goes through terraces at 1428 m. Colifablos, into another drainage system.

Very somewhat the same pattern - pine on south side, *Buxus*-*Genista* scrub on north, also a considerable area of oak forest. Pine on south side open and with scattered *Fagus*, <sup>locally almost dominant</sup> *Buxus* scrub rather open, also, on n. side.

The terrace not much below timber line. Great grassy slopes above, but grass very thin.

Valley bottom flat and cult.

Lower down valley some pine mixed with oak on north side.

Valley intersects a large one flowing south. We turn north ~~to~~ <sup>toward</sup> Torla.

Lower east side steep, pine covered, some broad-leaf trees. West side scrub covered. Bottom and lower slopes terraced and cult.

Above Torla the vegetation thins out, generally scrub except patches of pine in ravine. Magnificent cliffs. Streams clear, blue.

Turned east again in deep canyon. Pine forest on talus, ledges, etc. Cliffs almost bare.

*Buxus* common in undergrowth. Some *Fagus* mixed with pine.

This is Ordesa Canyon. *Fagus* in places is dominant but mostly *Pinus sylvestris*. On high ledges are lines of *Abies* (on south side).

Further up *Fagus* almost completely replaces pine, at least on south side, with admixture of *Abies* high up.

At the end of the road in Ordesa there is a compact very low turf in the valley floor, along the gravelly braided stream.

On the side of this, a luxuriant growth of *Buxus* with a few very feeble pines.

Above this a mixture of *Fagus* and *Pinus* in varying proportions, with a thin layer of very spindly *Buxus* 1-3 m. tall.

Low shrubs of *Daphne* and *Buxus*, very thin herb layer.



of *Pyrola* sp. *Vaccinium* <sup>etc.</sup>  
etc. and an irregular  
~~so~~ but thick moss layer  
on rocks. Humus thick  
between rocks. *Daphne*  
abundant in small openings  
2-4 m. tall. trees is 28 m.

5-40 cm dbh. Pine tallest

Many young *Abies* in  
same layer with *Buxus*.

*Crataegus*, *Forbesia* in small  
openings. Mosses abundant  
on trunks, esp. of *Fagus*.

Scattered young *Fagus*.  
No young pine, even in small  
openings.

Patches of *Abies pectinata*  
on flat ground, with a  
few pines and small beeches.  
1-5 m apart, 1-5 dm. dbh  
to 25 (or 30) m. tall.

Very thin shrub layer 2-3 m.  
tall of *Buxus*, some *Abies*,  
thin irregular ground layer  
of *Oxalis acetosa* & *Hepatica*,  
and abundant moss.

photo  
taken

Tremendous talus slopes  
on north side of valley  
at base of cliffs. Talus  
covered with a mosaic of  
pine & *Fagus* with scattered  
*Abies*.

On south side on steep  
lower slopes a pure stand  
of *Fagus*, spaced 0.5 to 3 (5) m.  
5-25 cm dbh. mostly curiously  
bowed at base <sup>from solidification?</sup>

ever complete. Shrub layer  
exceedingly sparse, only a  
few scattered *Buxus* and *Abies*  
0.5-1.5 m. tall, and small patches  
of *Fagus* seedlings. ~~or sprouts~~  
Ground layer <sup>very</sup> sparse,  
isolated *Carex* shoots,  
*Oxalis* and *Hepatica* near bottom,  
<sup>mostly</sup> absent above a few m.

Abundant boulders,  
up to 2 m across, covered  
by mosses, *Asplenium trichomanes*,  
*Cystopteris*, and rarely *Racomitrium*.

A few rotten stumps  
of much larger *Fagus*. Some  
windfalls.

Rich humus and litter  
filling in the spaces in  
the talus, changing gradually to  
mineral soil.



Abies forest on fairly steep slope 75 or 100 m above valley bottom, on north side, facing about S.E. trees 5-30 cm dbh. spaced 0.5 to 5 m. up to 30 m. tall.

Abies seedling  
fairly well developed shrub layer 1-3 m. tall, mostly *Buxus*, almost no herbs except sparse *Vaccinium myrtillus* (dwarf shrub), Moss on the abundant rocks.

Hepatica and Oxalis <sup>Patent</sup>

Some middle height trees - Abies & *Fagus*.

A few pines in upper layer.

*V. ulmifolius*, *Veronica*, seedling *Fagus* in thin place

~~On the north side of *Pinus lusitanica*~~  
to scattering of *Pinus*  
*Pinus lusitanica* in small tree layer.

Trunks of trees have abundant epiphytic epiphytes, sparse upward but noticeable.

*Hylacomium splendens* on ground also *Dicranum scoparium*  
*Isotrichum* ~~bracteatum~~ *viriparum*

Finished both hot & cold rolls in the open park-land of Andorra & cliffs around it.

In valley bottom, between the stream and the grassy flood plain terrace with the *Buxus* is a moraine-like irregular flat of stream gravel. It has scattered small pines, *Salix*, *Betula*, depressed patches of *Juniperus* perhaps 3 dm high.

The trees or really shrubs 3-5 m, pines rarely to 6 or 7.

Low tufts of *Thymus*, and rounded, dense spring mounds of *Genista hirsuta*. This herb and dwarf shrub depressed layer patchy. Moss layer patchy.

Considerable irregularly scattered shrubby patches of *Salix* and, rarely, *Betula* about 1 m. tall.

The whole very open, much gravel showing. The pines vary from 1 to 7 m in height.

The whole is doubtless flooded at times but not too often, or too long. Doubtless very well drained between wet periods.

Thin pine woods on gravel deposits sloping up from stream, thin shrub layer of *Buxus*.



At the end of the road the lower slopes on the north side form a series of terraces, doubtless man-made, the walls held by hedges of *Buxus* growing on the rock walls.

These are not exactly regular, and there are perhaps 10 or 12, the topmost one or two quite narrow and in the edges of the pine forest. The terraces are grazed to a close dense turf by cows.

Above there is a 45° talus slope covered by a pine forest, varying from open to closed, trees variously spaced, as close as 2 m, as far apart as 6 or 8 m. or more, up to 3-4 dm. dbh. 20-25 m. tall.

A well developed shrub layer, open to closed, 2-3 m high, mostly *Buxus*, occasional *Abies* saplings, *Hepatica*, *Vaccinium myrtillus*, a grass and a *Genista* (?) form the herb layer - rather sparse, the *Hepatica* and grass most abundant. Moss very abundant on rocks and

fallen log, some on earth. Soil black and brown between rocks of talus.

Few or no epiphytes. A few small *Fagus*. *Vaccinium* on pines.

Above this the forest thins out as the soil thins to rock and there is a band of scrub with scattered scrubby pines, *Tilia* at lower margin. The scrub is mainly *Buxus*, but locally *Genista horrida* abundant, scattered *Amelanchier*, small *Thymus*, *Iberis*, *Veronica*, etc. a real rock garden. Cliffs in places.

The *Amelanchier* penetrates well into the woods below but there is very scrubby and not a scarcely flowering.

Young pines mixed in scrub in several parts of this woods.

Generally the region studied or traversed has more mesophytic vegetation on north facing slopes, less on south.

In n.-s. valleys the differences are fortuitous.



*Quercus  
typical*

May 23 - 2 km. s. of Escuer,  
s. of Biescas, w side Rio Gallego  
in *Quercus* forest on steep  
alluvial slope

40857

*Carex halleriana*  
common

2

58

*Lithospermum purpureo-carmineum*  
abundant

1

59

*Melilotus meliss*  
occasional

1

60

*Quercus pubescens*?  
abundant

1

61

*Cytisus sessilifolius*  
rare, in shade

1

62

*Cytisus sessilifolius*  
common on sunny slope in scrub

1

63

*Helianthemum nummularium*  
occasional in open scrub on  
coarse alluvium

May 23 - Valle de Ordesa

1

64

*Viola sylvatica*  
occasional in *Abies* forest on  
steep talus.

1

65

*Amelanchier*  
common in scrub on steep  
rocky south-facing slope

1

66

*Buxus sempervirens*  
abundant in open valley bottom

2

67

*Thymelaea*  
common in open valley bottom

2

68

*Oxalis acetosa*  
very common on floor of *Abies* forest

1

69

*Pyrola minor*  
occasional in mixed *Pinus*-*Fagus* forest

900

2575 m.

flowers with limb deep blue,  
tube reddish.

Flowers pale pinkish-lavender  
without, cream within.

small tree 1 population

said to be hybrid

shrub 6 m. tall, flowers yellow

(said to be shade form of 40862)

shrub 0.8 m. tall, flowers  
yellow.

flowers pink

1400 m.

flower purple.

1450

1500 m.

shrub 1.5 m. tall, flowers white.

1300 m.

shrub 1.2 m. tall.

depressed dwarf shrub.

flowers white

1250 m.



L. L. L. L. L.

40870

*Pyrola (Monarda) uniflora*

occasional in Pinus-Fagus forest

71

*Asplenium fontanum*rare in crevices of boulders in  
Pinus sylvestris forest

72

*Ilex aquifolius*local in dense Abies forest  
on steep talus

73

*Lonicera*occasional on open gravel  
banks of stream

74

*Primula farinosa* var.

local in open turf in valley bottom

75

*Raimonda*rare, on boulders in dense  
Fagus forest on steep talus slope.

76

*Asplenium trichomanes*

on rock in Pinus-Fagus forest

May 20 Valle de Hecho

Casa Forestal

Limestone cliffs

77

rare in crevices

78

*Ceterach*moist ~~to~~ places

1350m.

1400m

fronds stiff

1400m

small understory tree; leaves  
and twigs with bitter almonds odor  
when crushed.

1300m.

shrub 0.8 m. tall; flowers  
red, ~~and~~ zygomorphic,  
ovaries united.

leaves whitish beneath;

flowers bright pink

sterile leaves appressed  
to rocks.

1350m.

950m.

flowers maroon.



May 24 - Jaca - Hecho

bet Jaca and Javierregay <sup>Rio Aragón</sup>  
are terraces along the river -  
the terraces cultivated,  
the slopes in degraded  
scrub or dwarf scrub  
or open dwarf scrub.

Many trees - *Populus* spp. <sup>River</sup>  
*Juglans*, *Salix*, etc.  
planted locally.

Gravelly river bed with  
irregular open scrub and  
dwarf scrub. In places  
this approaches forest in ht.  
Some pines on north facing  
slopes above river course.

Terrace soil gray to gray-brown,  
with much gravel.

Turning north from Rio  
Aragón, ~~the~~ we followed  
a tributary with a broad  
gravelly bed in a wide  
valley cut in a high terrace.  
On steep slope of this  
terrace is scrub, locally  
forest, *Quercus ilex* near  
top, *Q. pubescens* lower.

Dark brown to reddish brown  
soils on flood plain. Mixed  
cultivation, some vineyards.

Javierregay to Hecho.

Valley narrows, between  
foothills of mts. Slopes  
covered by scrub of *Buxus*  
and *Genista*. Some  
apparent reforestation on  
series of narrow terraces.

Somewhat up the valley  
the slopes are locally  
gentler and are generally  
cultivated where not more  
than 30°.

*Salix* abundant in river bed.

Stop above Embun - 700m.

Dry rocky slope with  
dwarf scrub of *Genista horrida*  
and *G. scorpioides*, *Thymus*, etc.  
varying to an open *Buxus*  
scrub mixed with low  
*Genista*.

*Choris monspeliensis*, *Helianthemum*  
*linum*, *Medicago* spp., *Phlomis*,  
~~*Broom*~~ *Avena horrida*, *Euphorbia*  
*exigua*, *Polygala monspeliensis*,  
*Ranunculus* sp., *Carex* sp. (*C. halleriana*),

*Carduus allardii* <sup>*mitis*</sup> *Linum narbonne*, *L. strictum*,  
*Eryngium campestre*, *Purpleurum*  
*opacum*, *Crepis*?, *Cirsium* sp.,  
*Microtus erectus*, *Ceranthemum*,  
and a considerable number  
of other herbs - these down within  
or between the spring shrubs  
thus protected from grazing  
which is obviously very heavy here.



The *Buxus*, *Genista* & *Thymus* apparently resist the grazing, also the *Phlomis*.

*Orobancha crenata* with *Genista scorpioides*.

This degraded scrub seems characteristic of much of what is seen along the lower slopes in these foothills. Varies locally to much more luxuriant scrub with *Quercus* etc. or to low grass with *Genista*.

Up the valley the aspect becomes more luxuriant, with larger *Buxus* and scattered small oaks etc.

Valley narrows to a rocky canyon, with a much denser and taller scrub on talus. Goats grazing in it.

Widens out again. Some scattered pine on steeper slopes, even on gentler rock slopes. Cultivation where there is soil.

Valley narrows again and walls are pine covered. Some cultivation in bottom. U-shaped.

At the Casa Forestal the valley is between enormous cliffs, with forested ledges. The dry ledges have a scrub forest of *Quercus ilex*, the broader slopes below have *Tilia* and the talus *Pinus sylvestris*.

shorter  
than  
a  
valley.

Spectacular limestone cliffs have a flora of crevice plants, the most spectacular being *Saxifraga longifolia*. Several succulents.

On ledges *Buxus*, *Tilia*, *Corbus*, *Prunus* form an irregular scrub.

In moister patches *Tilia*, *Fraxinus* with shrub layer of *Buxus*, etc. *Crataegus* & *Cornus* around margin.



May 24 - Valle de Hecho,  
above Embún  
on dry heavily grazed slope  
between ~~tuffs~~ of ~~basalt~~ ~~microphyllous~~  
spiny dwarf scrub

next  
to  
photos  
taken

Collected  
types

Stop on lower slopes of Peña  
Oruel - slope covered to a  
great extent with *Genista  
hirsuta*, with considerable  
~~very little~~ *Buxus*,  
some *Juniperus* (depressed)  
scattered pines.  
*Avena bromoides*  
*Thalictrum bulbosum*  
*Linum catharticum*  
*Polygala amara*  
*Helianthemum italicum*  
*Genista germanica*  
*Calluna halleriana*  
*Arostaphylos urticae*

- 40879 *Micropus erectus*  
common  
80 *Sherardia arvensis*  
common  
81 *Carduncella mitissimus*  
occasional  
82 *Choris monspeliensis*  
common  
83 *Orobancha cruentus*  
rare, associated with *Genista scorpius*

700 m

flowers pink

corolla maroon, rather glossy  
within, whitish without,  
stigma yellow on ~~point~~, red dorsally.



May 24 - Jaca - Bernués  
 Crossed a stream with  
 scrub on valley walls  
 up onto a cultivated alluvial  
 terrace south of Jaca,  
 toward Peña de Ornel.  
 Upper slopes of this are  
 pasture with open dwarf  
 scrub of *Genista scorpioides*  
 and very close cropped grass.  
 Hills above this covered  
 by irregular mixed  
 scrub: scattered pines.

(from p. 42)

adjacent slope, not  
 apparently different,  
 covered by a *Buxus* scrub  
 with many other species.

Farther into the hills  
 the slopes are covered  
 by open pine forest with  
*Quercus* and a dense  
 scrub with much  
*Genista bonida* and *G.*  
*scorpioides*, *Amelanchier*  
*Wet expositions* with much  
*Buxus*.

Second stop, ~~also~~ lower  
 slopes s.w. of Peña de Ornel  
 very eroded slopes.  
 Here *Genista bonida* is  
 abundant, with *Arctostaphylos*,  
*Genista scorpioides* and  
*Amelanchier*, *Buxus*,  
*Polygala amara*  
*Thymus*,  
*Thalictrum tuberosum*  
*Avena bromoides*  
*Lavendula vera*  
*Poa pratensis*  
*Taraxacum*  
*Globularia*  
*Koeleria*

Dense scrub on moderate  
 slopes of *Genista bonida*,  
*Buxus*, *Amelanchier*,  
*Arctostaphylos*,  
 many herbs and  
*Ophrys reticulata*

Farther in the hills pine  
 becomes quite abundant  
 on most slopes. Where  
 open a dense scrub of  
*Buxus*, *Genista*, *Lavendula*,  
 etc. or *Quercus ilex*,  
*Amelanchier*, etc.

Then an open scrub forest  
 of *Quercus ilex*, with *Buxus*.  
*Buxus*



3rd stop. An open scrub 3-4 m. high of *Quercus ilex*, with scattered *Juniperus* species and *Buxus sempervirens* in middle story<sup>2nd</sup> and *Lavandula* and *Genista scoparia* a lower near to m. *Antistaphylos* also. Many lower herbs.

Much bare eroded ground - a weathered conglomerate with interbedded sandstone.

The *Quercus ilex* is varied in leaf outline and spininess. The one without teeth are mostly flowering, the spinulose ones mostly not. Some trees have dentate and entire leaves on different twigs or even on same twig.

Some trees of *Juniperus* are infested with *Anacanthobius* and seem to be dying.

*Ostrya scolopax*

Frank Words  
Mamell Mc Cormick  
Dulse



Collected  
typedMay 24 - Collado de Ornel  
west foot of Peña de Ornel,  
south of Jaca

40884

*Thalictrum tuberosum*occasional in clumps of  
*Genista horrida* and *Q. scorpius*

2 85

*Arceuthobium oxycedri*very local, parasitic on  
*Juniperus oxycedrus*

1 86

*Ophrys ustulata*rare in dwarf scrub of  
*Genista horrida*.

1 87

*Thymelea thymeleoides*rare in dwarf scrub of  
*Genista horrida*.May 24 - hills 1 km. W. of Bermeo,  
south of Jacain open forest of *Quercus**ilex* and *Juniperus oxycedrus*.

1 88

*Ophrys scolopax*

rare

1 97

*Thesium*~~common~~ occasional

20- { 90

*Quercus ilex*

{ 91

~~very common~~

{ 92

{ 93

{ 94

{ 95

{ 96

1 97

*Juniperus oxycedrus*

1050 m.

flowers white.

1100 m.

host plant looks very  
unhealthy (heavily  
parasitized).buds blackish maroon,  
flowers maroon without, whitish  
within.corolla tubes purplish, lobes  
greenish.

930 m.

perianth light purple, lip  
dark brown, involute-cylindric,  
trilobate, column green, with  
pointed beak. like appendage  
dull glaucous green; flowers whitesmall tree - specimen one  
of series to show leaf variation.

shrub 2 m. tall, fruits turning reddish.



May 25 - Jaca to Liguier  
*Lolium* + *Populus* beginning  
 to shed fruit.

1st stop, on Rio Aragón <sup>set Jaca, Sta. Lilia</sup>  
 small bit of grazed terrace  
 between cult. fields and  
 edge of terrace - an open damp  
 scrub of *Thymus*, *Genista*  
*scorpius*, etc., with thin  
 grass of *Aegilops*, many  
 herbs of all sorts.

On steep slope of terrace  
 a dense scrub of *Viburnum*  
*lantanoides*, *Cornus sanguinea*,  
*Rhamnus frangula*, *Crataegus*  
*Ligustrum vulgare*, *Rosa* <sup>sp.</sup>  
*Berberis vulgaris*, *Lonicera*  
*xylosteum*, *Prunus spinosa*,  
*Rubus* <sup>sp.</sup> of *ulmifolius*, *Lonicera*  
*etrusca*, *Amelanchier*, *Prunus montana*

Herb layer *Rubia perigrina*,  
*Cracca* <sup>sp.</sup> but very poorly  
 developed. At edges a much  
 thicker herb layer with  
 many species.

Lowest terrace along  
 river - has a belt of  
 small *Populus*, *Lolium* ~~and~~  
*Cornus*, a few pine - rather  
 open with grasses <sup>*avena filifolia*</sup> etc.  
 Back of this an open  
 dwarf scrub, *Genista*

scorpius, scattered tall  
 shrubs of *Populus*, etc.  
 many herbs (*Orethys militaris*  
 (red)) *Linum*, *Aphyllanthus*,  
*Cistus*, <sup>sp.</sup> *Platanthera bifolia*,  
*Ophrys apifolia* (red), *Linum*  
*campanulatum* (red), *Choris*,  
*Plantago*, *Thymus*, *Glabularia*,  
*Linum narbonne*, *L. satyroides*,  
 several grasses and sedges

Gravelly bed between  
 channels is an irregular  
 scrub of *Lolium* <sup>*myricaria*</sup> with  
 open spots with a few  
 herbs, patches of open  
 garigue with *Genista*  
*scorpius* and even *G. horrida*,  
*Thymus*, *Cistus* <sup>sp.</sup> (*C. nummularis*  
<sup>sp.</sup> *pyrenaica* (red)), *Linum* <sup>sp.</sup>,  
*Lavendula*, *Doronicum suffruticosum*

Slightly higher parts  
 with open tall scrub  
 of *Populus*, *Lolium*, *Pinus*,  
*Crataegus*, *Quercus*, *Genista*,  
*scorpius* <sup>*Ligustrum*</sup> etc. with  
 much grass, esp. *Avena*  
*filifolia*.

Steep slope above this  
 on other side of rd. dense  
 low *Quercus pub.* forest.



2nd stop.

Terrace erosion near  
Sta. Cilia, in a soft pale  
gray muddy alluvium.  
~~the~~ Wooded ravine below this  
in cult ground.

Almost no plants on  
actively eroding surface.  
A few *Bumelia* spinosa.

Loose scrub on slumped material,  
general garigue plants.

In this area, on both side  
of the river, the edges of the  
high terraces are badly eroded.

W of Puente de la Reina -  
on s side vast scrub slopes  
on e. side, slopes of terrace  
open scrub of *Quercus ilex*,  
thinning downward to  
garigue, *Bumelia* local but  
abundant.

Terrace top garigue  
varying to *Q. ilex* shrub  
savanna, & *Q. ilex* scrub.  
Then cult. wheat fields  
some dissection.

More <sup>the</sup> scrub & scrub forest  
and *Q. ilex* park-land.

Various stages in regrowth  
of *Q. ilex* scrub forest. Just  
east of Berdun. Photos, both above  
of Berdun and of the spectacular  
scrub on terrace east of it. All  
stages of regrowth of *Q. ilex*.

from dwarf scrub patches (6. w.)  
to small trees 4-5 m. tall.  
gray grass.

W of Berdun very active  
erosion in same clay terrace.  
(beds?), braided river bed,  
ringards, rocky patch.

Slope on s. side open *Bumelia* scrub  
(bed.). Top of this terrace  
above cropped grass, slight  
invasion of *Geranium saxatile*.  
grading to garigue and  
*Bumelia* scrub, and *Bumelia*  
scrub with scattered  
*Quercus ilex*.

W of this. cult. flood plain  
with many trees - *Populus*,  
*Juglans*, etc. Gravelly  
area with open *Pinus*  
*sylvestris* forest.

Slopes on n. side with  
open scrub forest of *Q. ilex*.  
*Bumelia*, etc. shrub layer.

Ht. & density of tree layer varies.  
Some *Quercus coccifera*  
comes in as we go west.

Turned north through  
irregular scrub on slopes  
of terrace along Rio  
Lower terrace cultivated. Wheat.  
*Salvadora*.



First range very rocky, covered by *Buxus* scrub except cliffs, farther in, *Q. ilex* scrub, taller, very mixed; much *Q. pubescens*, some *Arbutus* woods. Windy to canyon. Scrubby slopes above.

Canyon opens out - slopes now covered by thin *Buxus* & *Genista* scrub, varying to thin grass and to dense *Buxus* scrub.

The next range has much higher ~~than~~ bare cliffs, ledges and talus with mixed scrub.

Farther in ~~are~~ some pine & *Ulmus* (?)

Then scrub thins out, becomes lower, mostly *Buxus*, patches of pine forest.

*B. purpurea*

Large open valley with cult. & pastured slopes showing stages of degradation to scrub.

As valley narrows again open pine forest or scattered pine on slopes, less or lower than above. This becomes more luxuriant as

we get farther in, but for some distances there is about as much scrub as open forest area.

Lowest slope cultivated. Farther in, canyon is narrower, cliffs above talus. Pine more prominent, some *Quercus pubescens*.

Then lower bluffs, with *Q. ilex*, some pine, much *Buxus*. Then

The valley broadens again somewhat, below Rorcal.

Then thick scrub pine forest on ~~south~~ both sides in mosaic with *Buxus* scrub.

Rorcal. A very pretty town.

Above - a mosaic of pine and scrub. More and more cliffs toward head of valley.

Becomes generally wooded, open or closed.

Uztarroz

Slopes covered with a mixed secondary scrub forest of *Ulmus montanus*, *Acer campestre*, *Pinus sylvestris*, *Corylus avellana*.

Some open pine forest or pine savanna on slopes above the town and on up the valley.



Some areas of open scrub.  
Then open pine forest and  
fairly closed pine forest  
with grass. Really rather  
open. Patches of grass  
pasture. Genista on steep  
rocky slopes.

This region is shale,  
rather than limestone.  
Dense pine forests. Some  
Fagus. Then pine mark-  
land, with short grass.  
Beech becomes dominant or  
mixed with pine.

Pine becomes scrubby  
and more open. Patches  
of dense forest, pine & beech,  
but more and more open.  
Much clearing.

High ridges grassy  
with stunted pine, or  
eroded places with Juniper.

many  
photos  
wood & bark  
close up of  
arches of  
genista.  
most  
aspects  
of reg.  
and  
landscape  
finished  
back  
roll.

Stop at top of pass <sup>Cold Canyon 1150m</sup>  
open grassy ridges, closely  
grazed. slopes with patches  
of Juniperus. lower slopes  
and ravines with  
Fagus, or Pinus.

The upper slopes, dominated  
by Juniperus, have in most  
places scattered young  
pines. Locally scattered  
very large Fagus - trunks  
5 dm. dbh. or more. crowns  
a bit small for this size trunks.  
Stumps abundant, showing  
that these slopes were relatively  
recently cleared. Stumps  
mostly of all Fagus. Beech  
sprouts abundant.

An abundance of herbs.  
This pattern on west  
slope. East slope no  
stumps. Abundance of  
small pines, except  
not so many near top.

Patch of pure beech forest,  
on west slope. Trees to 20 m. tall,  
4-60 cm. dbh. spacing 3-10 m.  
Moss on bases of trunks and  
exposed roots. Apparently no  
other species inside forest.

Crataegus around margins.  
Complete layer of litter, thin humus  
layer 3-4 cm. gray or gray brown  
clay mineral soil.  
Few small Fagus sprouts, 1 Crataegus seedling



A few *Arum* & *Conopodium* near margins. *Yucca* & *Crocus* also, nearer margin. and as margin approached many others.

Lower down valley but above Uytaroz bluffs with *Genista occidentalis*. (photo b.w.) below pine forests, above stream.

Lower down, still above Uytaroz, 2 photos of *Pinus sylvestris* forest. Rio Esca

Some *Abies* below Uytaroz.

Cross road, below Rneal, from Rio Esca to Rio Anso. Dense pine forest on south side, sparse pine in scrub on north.

Farther east, *Abies* on n. side (e. of Gards).

*Salix* cf. *ulgaris*, growing on absolutely bare road cuts & embankments.

Top ridges, near e. of Gards. Semi-open scrub forest of *Pinus* with *Buxus* shrub layer. Some areas grassy. *Buxus* thin out at extreme top, partially replaced by

*Juniperus*, and, in more open places, *Genista* ~~horrida~~ *horrida* and *G. scopina*.

On east side much less pine - generally *garrigue* with sparse pine. Slopes facing south almost lack pine. Some north facing slopes in Anso Valley, proper, have dense pine - fir forest. South facing slopes opposite have sparse *Buxus* scrub with scattered small pines. Uppermost slopes on s. side, above pine, have a ~~very~~ broad leaf scrub or scrub forest.

Anso Valley, proper, mostly cleared, flatter parts cult. slopes *Buxus garrigue*. (b.w. photo of Anso) slopes around Anso very badly overgrazed even the *garrigue* degraded.

Below Anso are gardens on terraces and along the stream banks.

Bare cliffs. mixed scrub on ledges, sparse pine and dense scrub, mostly *Buxus*, on talus.

Lower down - gentler slopes south pine and oak forests varying from open to closed. Some mixed.

More open and more scrub toward mouth of river.



For a good distance a complex  
of sparse ~~scrub~~ forest.  
~~and~~ Buxus scrub, quercus  
scrub, etc. Then a gorge  
with vertical & overhanging  
limestone walls.

Many species increase.

*Hypericum* sp.

*Lasiraga longifolia*,

*Raimonda*

*Asplenium fontana*

*Lasiraga hirsuta*

*Polystichum lobatum*

*Petrocoptes crassifolia*

*Cytinus sessilifolius*

*Globularia* sp.

*Sedum* sp.

*Silene* sp. *mutans*

*Galium mollugo*

*Carex*

*Ionica pyrenaica*

*Thymus* sp.

*Buxus*

*Acer opalus*

*Acer monspessulanum*

Gorge about 1 km.

Below it, open scrub oak  
and Buxus scrub.

After about 1 km. we  
emerge onto a narrow  
canyon the terrace of Rio Aragon.  
near B. L. L. L.



*Selected  
types*

May 25 - 2 km. E. of Santa Cilia,  
~~west~~ W. of Jaca, on Rio Aragon

- 40898 *Lepidium campestre*  
on alluvial terrace
- 1 99 *Coronilla ~~minima~~ ~~phylloides~~*  
on alluvial terrace
- 40900 *Rosa*  
on alluvial terrace
- 1 01 *Ophrys aranifolia*  
on alluvial terrace
- 1 02 *Orobanch*  
common in garigue on  
alluvial terrace, perhaps in *Thymus*
- 1 03 *Orobanche*  
rare in garigue on  
alluvial terrace
- 05
- 1 04 *Quercus pubescens*  
common in thicket on  
steep slope of terrace
- 1 05 *Lonicera intrusa?*  
rare at edge of thicket  
on edge of alluvial terrace
- On gravel river-bed
- 1 06 *Iris graminifolia*  
rare in wet spot
- 1 07 *Plantago cynops*  
rare in open places

From

flowers yellow.

perianth green, leaf brown,  
column appendage deflexed.  
~~small~~ plant pale brown,  
corolla pale pinkish buff,  
not varnished within,  
stigma golden brown, turning darker.  
plant reddish, of corolla  
pale without, flesh reddish  
within scarcely varnished  
in appearance, stigma bright  
yellow in front, red dorsally  
shrub 3 m. tall, sterile.

slender shrub 1 m. tall,  
fls. slightly glaucous  
beneath, flowers reddish  
without, white turning  
yellow within.

flowers purple with broad  
yellow stripe.  
erect.



40908

*Melampyrum*

rare

2

09

*Myrica germanica*  
occasional in low Salix  
scrub

1

10

*Quercus lusitana*?  
occasional

1

11

*Lavatera*

rare

1

12

*Tetragonolobus*

rare

May 25 - 1 km. w. of Santa  
Cilia, w. of Jaca, in Rio Aragón

1

13

*Convolvulus cantabricus*  
rare in garrigueMay 25 - gorge of Rio Ansobera  
south of Anso  
in crevices on limestone cliffs

2

14

*Smicra pyrenaica*  
rare

1

15

*Petrocoptis*  
common

1

16

*Allium molle*  
rare, foot of limestone cliff

1

17

*Laxifraga germ. sub. hirsuta*  
rare, in damp ravine in limestone cliffbracts purple, ~~the~~ corolla  
yellow with red tube.  
shrub 1.3 m. tall; leaves  
glaucous, flowers pink.~~the~~ erect shrub 3 m. tall,  
stems  
flowers pink.

flowers yellow.

550 m.

flower pink.

750 m.?

slender  
hanging shrub 1 m. long,  
flowers cream color,  
flowers very pale pink.flowers nodding, lemon  
yellow, greenish without  
in lower part of perianth,  
midrib green.

petals white, ovary pink.



*Collected  
by*

May 29 - Coll de Uytamoy  
head of Rio Espe, Navarre

- 40918 *Erica vagans*  
local on steep grassy slope
- 19 *Thymelea rupestris*  
locally common on grassy slope
- 20 *Galium verum?*  
locally common on grassy slope
- 21 *Fagus sylvatica*  
common on open slopes  
(also forming dense forests)

May 25 - 2 km. w. of  
Santa Cilia, w. of pass, ~~coll~~  
slope above Rio Aragon

- 22 *Alnus oxycedris*  
occasional in irregular  
scrub on eroded slope
- 23 *Acer campestre*  
common in irregular scrub  
on eroded slope
- 24 *Campanula*  
in irregular scrub on eroded slope

1152 m.

erect shrub.

*Quercus*

*Rhus*  
*Sorbus*  
*Urtica*

prostrate  
fl. yellow  
etc.

1 m. tall.

up to.



May 25 - Col de Uztarroz  
head of Rio Lepa, Navarre

- 40918 *Erica vagans*  
local on steep grassy slope
- 19 *Thymelea rupestris*  
locally common on grassy slope
- 20 *Galium verum?*  
locally common on grassy slope
- 21 *Fagus sylvatica*  
common on open slopes  
(also forming dense forests)

May 25 - 2 km. w. of  
Santa Cilia, w. of Jaca, ~~Leizaola~~  
slope above Rio Aragon

- 22 *Alnus oxycedrus*  
occasional in irregular  
scrub on eroded slope
- 23 *Acer campestre*  
common in irregular scrub  
on eroded slope
- 24 *Campanula*  
in irregular scrub on eroded slope

1152 m.

dwarf shrub.

prostrate

erect from slender prostrate  
stem, flowers greenish yellow.  
large spreading tree.

550 m.

shrub 3 m. tall.

shrub or small tree 4 m. tall,  
sap milky.

flower blue. ~~not~~ purple.



May 26 - Jaca & Sanport

Overgrazed hills, with thin grass and garrigue. Reforestation with *Pinus sylvestris*.

*Salix* scrub in gravelly ~~river-bed~~ river-bed. Thin garrigue also. Planted groves of *Populus*.

Above Castillo to Jaca some hills are cultivated, steep slopes have a thin scrub forest of *Quercus pubescens*.

On west side mostly *Buxus* scrub, very thin. Valley bottom cultivated, many trees. Farther up, stone walls

around the fields become prominent. Alluvial fans have ~~a~~ garrigue. Some orchards. Lowbushy poplars.

Valley narrows to a wide canyon. Lower slopes garrigue. Pine above. Much *Quercus ilex* in garrigue. River between cliffs. Some *Salix* in bottom. *Saxifraga longifolia* on cliffs.

Several series of higher cliffs above. Scrub forest on ledges between them. Some grassy slopes.

1100 m.

~~Canfranc~~ ~~Hill~~ ~~Canfranc~~ Some grass in valley bottom which is wide here, also

cultivation. Thickets.

Lower slopes somewhat terraced. Much *Tilia*.

some *Quercus pubescens* (?) in lower parts, also

some pine. More pine higher on sides, with *Fagus* (?)

1200 m. International station - ~~Canfranc~~ <sup>for Canfranc</sup>

Above here *Fagus* is mixed with pine in patchy manner. Forest rapidly gets scarce. Mainly replaced by *Buxus* scrub. Some bare rock slopes cliffs. Some close-cropped grass, mostly with scattered *Buxus*.

Deep river ravine filled with mixed deciduous forest, a few pines. Farther up, mostly pine. Patches of good pine forest and of *Fagus* forest on slopes.

1450 m. 1st stop

Grassy slopes with scattered *Buxus*. Many flowering herbs.

<i>Veronica</i>	<i>Fritillaria pyrenaea</i>	<i>Veronica</i>
<i>Androsace</i>	<i>Herb. nana</i> - <i>Orchis</i>	<i>Thymus</i>
<i>Androsace</i>	<i>Belle</i>	<i>Helleborus</i>
<i>Veronica</i>	<i>Primula</i>	<i>Alchemilla</i>
<i>Gentiana</i>	<i>Trifolium</i>	<i>Anthyllus diellii</i>
<i>Androsace</i>	<i>Thymus</i>	<i>Sax. granulata</i>
<i>Potentilla</i>	<i>Helianthemum</i>	<i>Grysmum</i> ?
<i>Helianthemum</i>		



This is actually a debris cone, with limestone blocks of all sizes, interstices filled with humic soil and a dense sod on surface, rather close cropped.

*Juniperus sibirica*?

*Calluna vulgaris*

among limestone blocks!

rather stunted. Some rocks

have no sandstone - most!

*Lotus hirsutus*

*Carex flacca*

*Globularia wilsonii*?

*Narcissus princifolius*

*Iberis sempervirens*

*Cephalanthus encipalis*

Above the stop, the slopes are almost all grassy or covered by prostrate *Juniperus*. <sup>Calluna</sup> scattered very small pines. Rock is red schist. Very heavily grazed. Higher up, mostly *Calluna*.

Col de l'Import

Rocky hills covered by a mat of *Calluna*, with some *Juniperus*, small copes of *Fagus* 2-3 m. high, some slopes locally covered by a mat of *Rhododendron ferrugineum*.

A few scattered pines locally.

Some grass in between the *Calluna*. Some compact herbs

*Gagea villosa*

*Arenaria*

Just lower down a small wood - scrub forest of *Fagus* with *Picea quadrifolia*.

*Dryopteris lobata*

*Oxalis acetosa*

*Viola* sp.

*Veronica* sp.

*Hepatica*

*Blechnum spicant*

*Polypodium*

*Polystichum commune*

*Cystopteris*? (young)

several other herbs, too

young to recognize

*Vaccinium myrtillus* (margins)

*Luzula*

~~*Rubia fruticosa*~~

*Asterula odorata*



*Ranunculus*  
*Ajuga*  
*Thelypteris lancea*  
 Bases of trees covered  
 with moss to 3.5 m.  
 Trees tangled, curved  
 at base, maximum 7 cm. dbh.  
 Trees noticeably twisted.  
*Polypodium filix-mas*  
*P. "spinosum"*  
*Scilla lilis - hyacinthus*  
*Polystichum lonchitis*  
 + hybrids bet. *Polystichum*  
 & *Dryopteris*.

Lower ~~down~~ down the heath  
 mat gives way to *Fagus*  
 forests, with a scattering  
 of *Abies*. Some ~~at~~ slopes  
 a mixture of heath & grass,  
 some a close grass sod with  
 many herbs.

Sprungy places on  
 fairly level ground  
 dominated by *Caltha palustris*  
 but with much moss  
 and many herbaceous species.

Moles are very abundant  
 throwing up mounds like  
 gopher mounds in great  
 profusion ~~on~~ the grassy  
 sod.

This entire heath area  
 seems to be on the red  
 Permian schist.

The heath is on steep slopes  
 is quite patchy, mostly  
*Calluna*, but patches of  
*Vaccinium myrtillus*, etc.  
 with grass between.

Lower down is mostly  
 Beech forest. ~~Forest~~ *Abies*  
 An open seepy, boggy place  
 dominated by *Equisetum*  
*hyemale*, and *Carex lasiocarpa*  
 Some *Caltha palustris*,  
 an abundant sterile grass  
 and many smaller herbs.  
*Pteridium aquilinum* *fraxinifolium*.  
*Orchis*, *Erica vagans* in hummocks,  
 no *Sphagnum* but  
 much moss.

Above this is a beech forest,  
 trees irregular in size,  
 to 25 cm. dbh.

Springy and very  
 wet, an enormous  
 herb flora.

The *Equisetum* extends  
 in a few m.

Many ferns, *Daphne*.



*Helleborus viridis*

*Fragaria* sp.

*Paphiopedilum*

*Oxalis*, various umbellifers  
*Rubus*, much more  
 ground, some in back  
 of trees.

Many stumps locally  
 but seem to be broken,  
 rather than sawed.

The aspect is completely  
 different from beech forest  
 seen yesterday.

Possibly the water that  
 trickles down over the ground  
 is calcareous (the *Criophorum*  
*latifolium* suggests this) or  
 it may wash away the  
 toxic products of the beech roots.

Below Urdos, spectacular  
 cliffs with little vegetation.  
 Then grassy slopes  
 with patches of forest  
 and savanna, mainly oak.

Below Urdos, below  
 stop in deciduous  
 forested area - followed  
 trail up the left wall  
 of the canyon through  
 a mosaic of rich meadows  
 on steep slopes - almost  
 more flowering herbs  
 than grass and mixed  
 deciduous thickets - to  
 sheer limestone cliffs  
 many hundreds of  
 m. high. Trail cut into  
 them.

Many plants with  
 Mediterranean affinities  
 on these dry cliffs  
 growing in crevices.  
 Cliff facing east.

*Rhamnus alaternus*

*Chamaelea* *divica*

*Juniperus*

*Buxus sempervirens*

*Globularia*

*Amelanchier*

*Saxifraga longifolia*

*Helianthemum* sp.

*Antirrhinum majus*

*Quercus pubescens*

*Hedera helix*

*Cynanchum*

*Fragaria*

*Asplenium trichomanes*

*Carex* sp.

*Practica perennis*



Along trail many new species

*Aphyllanthes* (white)

*Galium mollugo*

*Helianthemum* sp.

*Cornilla* sp.

*Thymus*

*Teucrium* sp. ?

*Silene*

*Lysichis alba*

*Laserpitium gallicum*

*Globularia nana*

*Aphyllanthes* (blue)

Meadows with

*Medicago*

*Ranunculus*

*Trifolium*

*Orchis*

*Chrysanthemum*

*Plantago*

*Veronica*

*Poa*

*Anthyllus*

*Rhynanthus*

*Asperula*

*Bellis*

*Leschima*

*Echium*

*Galium*

*Crepis*

*Lysichis*

*Pimpinella magna*

Bedous  
~~Bedous~~, on R. deff

420m.

Cliff of crystalline rock  
with sparse ericaceous  
dwarf scrub

*Erica vagans*

*Genista pilosa*

*Daboecia cantabrica*

*Ligustrum vulgare*

*Ulex nanus*

*Calluna vulgaris*

*Sedum portulacastrum*

*Galium mollugo*

*Silene*

*Asplenium trichomanes*

*Veronica sulcata*

*Sanguisorba minor* s. *maritima*

*Genista hispanica* s. *occidentalis*

*Trumbidium corymbosum*

*Rosa*

*Sedum saxifraga*

*Oxalis corniculata*

*Clematis*

*Rubus* sp.

*Geranium robertianum*

*Geranium sanguineum*



*Collected  
typical*

May 26 - Riozeta, near  
headwaters of Rio Aragon  
in dense grassy sod with  
abundant scattered juniperus shrubs

- 40925 *Anthyllis delilei*  
very common
- 26 *Fritillaria pyrenaica*  
very common
- 27 *Laxifraga granulata*  
occasional
- 28 *Androsace villosa*  
~~occasional~~ common
- 29 *Cephalanthes ensifolia*  
rare
- 30 *Narcissus junciifolia*  
very rare
- 31 *Iberis sempervirens*  
rare

1450 m.

lobes of petals rocced.

flower pendent, bronze  
color, green with dark  
markings within.

flowers white  
depressed plant,  
flowers white.  
- flowers white.

corolla pale yellow, crown  
yellow.

- depressed plant,  
flowers white, fragrant.



May 26 - Col de Lomport

Exposed rocky pass

40932 *Arenaria*

on bare rock

33 *Daphne laureola*

common in low mats

of *Rhododendron ferrugineum*

34 *Gegoris vitellina*

occasional on bare rocks

35 *Rhododendron ferrugineum*

locally abundant

on steep sheltered slopes

35a *Autostaphylos nva-ursi*

common in

May 26 - headwaters of

Gave d'Aspe, just below

Col de Lomport

in low Fagus woods

36 *Dryopteris lobata*

common

37 *Luzula*

very local

May 26 - Peyrenère, head

of Gave d'Aspe, below Col de Lomport

38 *Galium*

rare in patch of *Vaccinium*

myrtillus on heathy slope

May 26 - Fages d'Albel, upper

Gave d'Aspe

39 *Luzula latifolia*

occasional in neutral bog at

edge of Fagus forest

1635 m.

flowers white,

flowers greenish-yellow.

depressed plant,  
flowers yellow.

dwarf shrub,

2-3 dm. high, spreading;  
sterile.

dwarf shrub; corolla unicolor,  
white with rose mouth and limb.

1550 m.

erect, flowers greenish-yellow.



*Passiflora*  
*lanceolata*

May 24 - Pont de Sebers,  
Gorge d'Aspe

In deciduous thickets on

40940

*Lasiolepis aizoides*

occasional in crevices  
in limestone

41

*Acer opalus*

occasional

42

*Rubia perigrina*

occasional on bushes

May 26 - Gorge d'Enfer,  
above Fort du Portalet, upper  
Gorge d'Aspe

#

in crevices on <sup>great</sup> limestone  
cliff, south exposure

43

*Carex*

occasional

44

*Asplenium fontana*

occasional

45

*Rhamnus*

occasional

46

*Juniperus*

occasional

47

*Thymelea dioica*

common

48

*Galium*

rare

49

*Erinus*

occasional in sheltered place

50

occasional on side of path cut in

51

*Aphyllanthus*

common on side of path cut in

640 m

limestone

flowers white

shrub 3 m tall, sterile

scrambling extensively

small <sup>tree</sup> shrub, immature  
- fruit narrow.  
shrub, m. tall.

dwarf shrub; flowers  
- yellow.

flowers white

flowers bright pink,  
fragrant.

flowers blue.

cliff

cliff



40952 *Cynanchum*  
in shaded ravine on cliff

May 26 - Bedous, on gorge  
d'Aspe  
in heath vegetation on  
"opposite" cliff

53 *Labroecia cantabrica*  
common

54 *Languinaria*  
common

erect; flowers greenish  
cream color.

42024.

dwarf shrub, flowers  
unisexual, oblique, pink.  
erect, flowers greenish



May 27 Col de Launde  
"landes" on benzolite  
outcroppings of a near-  
serpentine siliceous rock  
The slopes covered by  
*Erica vagans*, *Calluna*  
*vulgans* and *Genista* sp.  
with dense grass. heavily  
grazed.

On rocks *Asplenium*  
*septentrionale*, *A. trichomanes*  
and a number of other  
species.

1. *Pinguicula* on moist  
turfy spot. No trees.
2. *Blechnum spicant*
3. *Thesium*
4. *Pteridium aquilinum*
5. *Juncus communis*

Beech forest on steep slope.  
Trees mossy in lower 4-6 m.  
very varied in size - to 12 m.  
tall, 5 dm. dbh. 4-10 m. apart, closed.

Considerable herb layer

*Asplenium filix-femina*

*Luzula latifolia*

*Blechnum spicant*

*Hypericum* sp.

*Euphorbia* sp.

a fine grass.

*Saxifraga* sp.

*Hedera*

No shrub layer except  
a few sprouts of *Fagus*  
of all sizes.

Much moss on ground.

*Thelypteris lunaria*

*Veronica*

*Oxalis acetos.*

*Dryopteris filix-mas*

*Geranium robertianum*

Calcareous talus slope,  
lower slopes of Turand.

partly covered with  
*Fagus*, partly grassy  
*Festuca* sp. some *Genista*  
In an opening with  
little grass a colony  
of *Valeriana* on the talus.

Just below, in edge of  
wood, but on talus  
*Aquilegia* - blue but  
with several plants  
with white fls.

Grassy slopes under  
large *Fagus*, to 9-10 m. dbh.  
with *Hieracium* + other herbs.

On some of this talus  
a few *Erica* plants!



Craggs of limestone from  
which the talus originates.  
A real rock garden -  
in crevices Enurus,  
Helianthemum, Festuca,  
Genista, Lotus, Gypsophila,  
Petrocoptes, Asperula,  
Globularia nana, Valeriana,  
Asplenium trichomanes  
Hieracium, Globularia (large)  
Rhamnus, ~~Erica~~ Erica  
Alchemilla patens, ~~gentiana~~ gentiana, ~~facilrago~~ <sup>gentiana</sup>  
These and some additional  
in broken debris - incl.  
Echinum, large Festuca <sup>spadicea</sup>  
loose seeded grasses. <sup>festuaria</sup> in sterile  
umbellifer.

May 27 - Col de Landerne,  
above Baranc

"herzholite" exposure

- 40955 Genista hispanica var. occidentalis  
very common on rocks (and soil)  
56 Festuca spadicea  
local on rock outcrops  
57 Pulmonaria repens  
~~local~~ common on rocks (and soil)  
58 Pinguicula  
local on moist ~~rocky~~ turfgy places  
59 Potentilla splendens  
on rocks  
60 Polypodium vulgare L.  
in rock crevices  
61 Asplenium septentrionale  
common in rock crevices

prostrate shrub,  
flowers yellow  
caespitose.

flowers blue.

flowers deep purple

petals white.

rhizome sweetish.



- 40962 *Thesium divaricatum*  
common in heath on  
63 ~~Thesium~~ *Galium saxatile*  
on hummocks around rocks  
64 *Polygala*  
occasional in heath on

May 27 - Col de Lounde  
slopes of ~~the~~ Tarnay

- on steep <sup>limestone</sup> ~~grass~~ talus  
65 *Carex glauca*  
common in firm places  
66 *Hieracium*  
common in firm places  
67 *Valeriana montana*  
common on loose steep talus  
68 *Aquilegia*  
common on loose steep talus  
2 69 *Aquilegia*  
rare on loose steep talus  
semi-shaded, with blue form.  
3 70 *Festuca spadicosa*  
common  
1 71 *Neothia nidus-avis*  
rare on steep slope under Fagus  
2 72 *Anthyllis*  
common  
1 73 *Gentiana*  
local on firm steep talus  
1 74 *Globularia*  
local on firm steep talus  
1 75 *Senecio doronica*  
rare on firm steep talus

flowers white.  
flowers white.  
flowers pale lavender-blue.

flowers bright yellow.  
flowers white to lavender.  
flowers bright blue -  
violet, spurs <sup>hooked</sup> ~~curved~~ at tips.  
flowers clear white,  
spurs <sup>hooked</sup> ~~curved~~ at tips.  
densely caespitose.

flowers yellow distally  
flowers purple, already  
closed.  
flower mauve.  
flower orange-yellow.



43

in crevices of limestone  
rocks

40976

*Globularia nana*  
common

1 77

*Rhamnus pumila*  
local

1 78

*Lonicera pyrenaica*  
very local

1 79

*Asperula pinta*  
common

2 80

*Gypsophila*  
abundant

2 81

~~Helianthemum~~ *Helianthemum canum*  
abundant

~~82 Festuca~~

2 82

*Festuca*  
occasional

1 83

*Lotus corniculata*  
common

2 84

*Petrocoptis crassifolia*  
common

1 85

*Sisymbrium pyrenaica*

1 86

*Rhamnus alpinus*  
rare

1 87

*Erica vagans*  
occasional

1 88

*Cystopteris fragilis*  
occasional

2 89

*Thymus serpyllus* (near lat.)  
common

2 90

*Saxifraga caerulea*  
common ~~on~~ ledges  
in broken rock

flowers dull pale lavender;  
dwarf shrub, ~~appressed~~  
to rocks.

dwarf shrub, appressed to rocks.  
small shrub, flowers  
white, tinged with pink.

dense tufts, flowers  
white to pinkish.

depressed clumps,  
flowers bright yellow,  
slightly orange in center.  
forming tufts

flowers yellow.

somewhat glaucous;  
flowers pale pink.

branched herb 0.7 m. tall,  
flowers bright yellow.

dwarf shrub appressed  
to rocks; sterile.

small shrub, much  
branched, 0.7 m. high.

prostrate; aromatic;  
flowers rose pink.



Small  
figured

40991

May 27. slopes above  
Lannance toward Col de Lannade  
*Asplenium scolopendria*  
common in grassy and  
weedy banks along trail

May 28 - Bois de Bager.

- in deciduous forest, principally *Quercus*
- 2 92 *Athyrium filix-femina* (L.)  
common
- 1 93 *Luzula forsteri*  
rare
- 1 94 *Lonicera*  
common
- 2 95 *Ruscus*  
abundant, locally forming  
a definite layer
- 1 96 *Herposiphocarpus*  
common
- 1 97 *Blechnum spicant*  
very common
- 98
- 98 *Ilex aquifolias*  
common, forming a conspicuous  
layer in *Fagus-Quercus* forest

flowers white.

shrub to 0.5 m. tall.

corollas bronze.

sterile fronds ascending,  
fertile fronds erect.

shrub 3-4 m. tall; leaves  
stiff, glossy, with  
bitter almond odor when  
broken; fruit immature.



May 23 - road east of  
St. Christian

Steep front slope of  
Pyrenees densely wooded  
with broad-leaved forest.  
Only the very lowest slope  
cleared and in meadow.

Some low hilly field  
is pure stand of *Pteridium*  
*equilinum*, harvested  
each year for bedding  
for cattle. Peculiarity of  
Basque country. Pure

stands maintained by  
cutting. Important as manure. <sup>germinated</sup> <sup>fruitful to seed</sup>  
In valley bottom patches  
of cultivation and of woods.

Bois de Bager. Administered  
by *Dept. des Eaux et Forêts*. Many  
introduced species, esp. from  
western N. Amer. & Japan. etc.  
Humid climate.

Naturally, the lower  
slopes of this area are wooded  
by *Quercus robur*, but this  
has suffered much from  
*Ooidium quercitum*, has been  
replaced by the more resistant  
*Q. rubra*. Higher *Fagus* is  
dominant. A little *Abies*  
near top of slopes.

Tournefort  
"Fausse Allantag.  
des Pyrénées"

Open forest, mostly  
*Quercus robur*, large  
trees ~~over~~ to 4-5 dm dbh.  
25-30 m. tall, spaced 10-15 m.  
crons not touching. Dense  
undergrowth to 3 m. tall.

This varies to a closed  
forest, with scattered  
or at least open undergrowth  
3-4 m. high, more dense  
layer 0.5 m. of *Ruscus*, *Rubus*,  
*Dryopteris*, *Allyrium*, *Claytonia*,  
and many herbs.

*Corylus* forms a large  
part of the <sup>shrub</sup> layer,  
with *Crataegus*, *Fraxinus*.

*Hedera helix* common on  
ground, climbing in trees.

In some parts of the open  
forest the shrubs are  
sparsely distributed, ferns,  
esp. *Pteridium* & *Dryopteris*  
*montana*, abundant.

Across the road a ~~forest~~  
<sup>with some *Quercus* open</sup>  
*Fagus* forest, trees all size  
up to 3 dm dbh. spaced 2-6 m.  
Sparse understory of  
shrubs <sup>mostly</sup> *Ribes*, etc. 2-5 m. some  
trees to 30 m. <sup>*Fagus* saplings</sup>

Herb layer rather open,  
of *Polygonum*, *Hypericum* etc.

regarded  
this  
as  
primitive  
but actually  
hard in  
Pteridium  
more  
valued  
than in  
esp.  
Need a  
certain  
proportion  
of *Landis*  
for an  
area  
of *agave*  
because  
no  
strong  
from  
grass.



patches of *Ruscus* to 0.4 m.  
*Hedera* common on ground.  
 Moss on ground and lower  
 parts of tree trunks.

Walking scarcely impeded.

Flora here almost completely  
 different from that in the  
 oak forest, much poorer.

10 km. E. of Oloron -

Extensive island Atlantic  
 or "tonga" of *Pteridium*  
 with a ~~to~~ *Sphagnum*  
 bog in a low area.

- c *Erica tetralix*
- o *Polygala vulgaris*
- c *Drosera rotundifolia* (in bog)
- c *Carex stellulata*
- c *Carex* sp. *paniculata*
- o *Phrynospora aurea*
- c-a *Marthecium*
- c-2.a *Eriophorum vaginatum*
- ~~*Gerardia*~~
- o *Calluna vulgaris*
- Gerardia anglica*
- Drosera intermedia*
- Urtica dioica*
- Hypericum elodes*
- Urtica*
- Potamogeton*
- Eleocharis acicularis*
- Ranunculus flammula*
- R. repens*
- Potentilla reptans*

In *Pteridium* heath

- a *Pteridium aquilinum*
- a *Calluna vulgaris*
- a *Ulex nanus*
- c *Polygala vulgaris*
- o *Helianthemum* sp.
- a *Chrysanthemum leucanthemum*
- several grasses
- c *Hieracium auricula*



Lowers  
typical

May 28 -

10 km. e. of Oloron,

in open Pteridium heath

- 40999 *Pteridium aquilinum*  
dominant

- 41000 *Polygala vulgaris*  
occasional (with 41001, 41002, 41003)

- 01 *Polygala vulgaris*  
common (with 41000, 41002, 41003)

- 02 *Polygala vulgaris*  
common (with 41000, 41001, 41003)

- 03 *Polygala vulgaris*  
occasional (with 41000, 41001, 41002)

- 04 *Arenaria*  
common

- 05 "Tridax"  
common in trail

- 06 *Nardus stricta*  
common locally

- in bog  
07 *Eriophorum*  
locally abundant

- 08 *Leucocyclus humilis*  
common

- 09 *Carex stellulata*  
common

- 10 *Carex panicea*  
common

- 11 *Rhynchospora*  
occasional

- 12 *Hieracium auricula*  
common

rhizome buried, fronds  
erect, not completely  
unrolled.

corolla rose, crest white.

corolla blue violet, crest  
somewhat paler.

corolla and crest blue-violet

corolla and crest rose.

erect

sub-  
caespitose.

flowers yellow

flowers yellow



4/10/30

4/10/30

Galium

on small hummocks

In muddy pool trampled  
by cattle

10 Juncus effusus f. conglomerata  
local

15 Illecebrum verticillatum  
very local and rare

16 Gerardia anglica

~~occasional~~ occasional around edges

17 Carex  
common

In small stream in heath  
18 Galium uliginosum  
occasional, ~~local~~

19 Potentilla reptans  
occasional

20 Veronica  
common

21 Anagallis tenella  
locally abundant

22 Eleocharis  
locally common

flowers white.

flowers white.

creeping, flowers yellow

prostrate, sterile.







degraded on lower slope  
to grassy <sup>heavily</sup> with <sup>abundant</sup> scattered  
scattered juniperus & much  
Erica vagans, Dorychnum  
subfruticosum

Juniperus locally forming  
open scrub

Mollinia

Brachypodium

Lulus corniculatus

Rosa arvensis

May 23 - 2. of Bassouet <sup>just as of divide.</sup> <sup>4-5 m.</sup> <sup>Montequin</sup>

On one side of road a semi-  
open oak forest. On other a <sup>more</sup> closed  
oak forest, trees 15 m. tall, 4-20 cm  
dbh. spaced 1-4 m. canopy  
30-70. Rather pronounced

second story 3-5 m. of juniperus,  
Ulmus, Acer campestre, & esp.  
Crataegus, a lower shrub  
layer 1-2 m. of Rosa, Prunus  
spinoza, Cornus sanguinea,  
Acer, Rubus, Lulus terminalis

<sup>+ herb</sup>  
a dwarf shrub layer of  
Erica, Rubus, Rosa. and  
~~herbs~~ - Rubia peregrina, Hedera  
Helix, Vaburnum lantana,  
Arum sp. Juniperus,  
Carex glauca

are almost complete ground  
layer of Hylocomium triquetrum.

some mossy bases of  
trees & sticks, etc.

The canopy is of Quercus  
robur, but no seedlings.  
a few suppressed trees.

a little Ligustrum

Rosicera sp. <sup>mostly side, south facing slope.</sup>

The open forest on the other  
side is a hybrid swarm  
of Quercus petraea-subsericea robor.  
Much juniperus, Genista  
scoparia, Ligustrum vulgare,  
Dorychnum, some Erica vagans,  
a little Prunus spinosa, Rosacannia  
dense herb layer.

Up slope, the forest becomes  
denser, stature still less  
than 8-10 m. juniperus  
becomes more luxuriant  
and denser and reaching  
10 m. ht. other shrubs  
become less, except in open areas.

Herb layer everywhere  
well developed, mostly  
grass, but various other  
herbs. Puccinellium abundant.

Nearby slope degraded  
to open dwarf or low scrub of  
Dorychnum, etc.



*Labelled  
by me*

1960 France

May 29 - Couffios Bois, east of  
Arzacq,  
in small oak woods on  
edge of Ulex heath.

- { 41023 Quercus toza  
41024 Quercus toza  
common

May 29 - Lauret, 5 km. west  
of Gardin

- 25 Dorychnium suffruticosum  
very common in ~~the~~  
heath with Juniperus bushes  
26 Quercus pubescens  
codominant in oak forest  
on south slope  
27 Rubia perigrina  
common in undergrowth  
in <sup>dry</sup> oak forest on south slope

May 29 - 4 km west of  
Montequison

- 28 Loriscera  
occasional in Quercus robur forest  
29 Quercus pubescens  
dominant in dry oak forest  
on south slope  
30 Hylocomium triquetrum  
forming a continuous layer  
on floor of Quercus robur forest.

Barns Pyrene

small tree, all seen  
infected by fungus.

small aromatic shrub  
0.5 m. tall; flowers white

~~small tree~~ small tree.

scrambling over bushes,  
very thick.

Yes

slender shrub; fruit immature.

small tree.



May 31 - bet. Montpellier and coast - mostly vineyards. Along immediate coast a belt of dunes with *Ammophila arenaria* and a number of other species of herbs - *Cruanella maritima*, *Anthemis*, *Helichrysum*, etc.

Bet. Montpellier and St. Gilles ~~the~~ vineyards are certainly the dominant cultivation and the dominant vegetation type.

In the low delta land of the Camargue the former salt marshes have been almost entirely converted, during the last 8 years, to rice culture by the construction of an enormous canal providing water for irrigation.

East of Arles in the region called the Crau the land is very flat, but just high enough to be dry. At this season, at least, there is almost no vegetation. Flat dry fields, some of them planted relatively recently to widely spaced trees, others with closely

scattered piles of stones, put there by French prisoners under German orders during the war, to prevent landing of Allied planes.

Between Salon and Marseilles the country is rougher and greener. There are long cliffs or rim. rock surrounding plateaus of limestone. The hills are covered by a locally dense, locally sparse garrigue, much of it dominated by *Quercus coccifera*, locally a scrub or scrub-forest of *Q. ilex*, and partly by pine of various ages - originally planted, probably, but certainly spontaneous now. The degradation of the *Quercus*, *ilex* and pine by fire results in the low scrub or garrigue. The *Quercus coccifera* is in places mat-like. Locally goats have cleaned off the vegetation so that little but bare limestone remains.

Olive trees frozen in 1956 and putting forth numerous sprouts either bare or from trunks.



June 1 - trip by rail from Montpellier to Geneva.

Gently rolling land with light reddish soil, darker in low places, mostly vineyards, some orchards. Mostly of dwarf trees (?). <sup>apple</sup> <sup>peach</sup>

Small groves of *Pinus pinea*, rows of *Platanus*, *Populus*, etc. some hedges but not many.

8-10 minutes from M.p. a few patches of scrub of *Quercus ilex*, open or more less closed. Lunel.

Many trees show effects of 1956 frost.

A few meadows.

Low hills, or terrace sides, to left covered with scrub. Some olive grove recovering from freeze of 1956 but still looking very bad.

Considerable *Q. ilex*, some young olive groves.

More low hills to left with *Q. ilex* and *garrigue*, for some distance.

Nîmes.

Above Nîmes a change from a predominance of vineyards to more meadows, with some vineyards locally. Country very flat. Then slightly rolling with

patches of pine, *Q. ilex*, etc. Some very low hills, then, on right broad flood plain of Rhone. Rr. follows <sup>W</sup> edge of terrace - this edge with varied mosaic of *Q. ilex*, grass, *Cystisus scoparius*, etc. Some very scrub looking olive. Then some limestone outcrops low ~~terrace~~ cliffs, erosion remnants, etc. Then gravel terraces. Hills to left.

Crossed Rhone. Flood plain very green, rows of trees, etc.

Entered some hills on other side - rounded, partially bare, partially with a mat of *Quercus coccifera*, some *Q. ilex*, some grass. Some of ~~the~~ rocks actually seem ~~polished~~ polished. Most of ~~the~~ rock on left, some cliffs.

Then country is flat ~~again~~ again. <sup>broken</sup> Windbreaks are abundant. Crossed another fairly wide river. (Durance?)

Avignon.

Then low agricultural land with abundant hedges, windbreaks and rows of trees. *Sorgos* - Chateau d'Arles du Pape.

Some areas of rolling gravel with *garrigue* & *Q. ilex*.



Considerable vineyards.  
More *Quercus - Ilex* scrub.  
Low-lying agricultural land  
with meadows & hedges.

A ~~field~~ of bearded  
wheat or barley with black  
beards (several).

Predominantly grain  
and other crops.

Orange.

Cypress windbreaks - against  
mistral.

Small areas of open *Q. ilex*  
scrub or scrub forest. Larger areas  
in low hills on left. Broad  
flat ~~flat~~ valley to st. Then  
limestone erosion remnant on st.  
and the valley is on left.

Open scrub forest of *Q. ilex*.  
some badly frozen ~~but~~ olive groves.  
Small pine forest, rather  
open. Flat topped mesa-like  
remnants. Garrigue and small  
pines on slopes.

Mondragon.

Open rather rolling country  
some scrub.

Great canal.

Pollenc.

Flat agricultural land. A few  
vineyards. Grain.

La Vaid.

Flat agricultural land, some  
hedges & rows of trees. Black topped

grain rather common.

A few Robins, ~~not~~ not seen  
till now.

Broad open grain fields with  
no hedges or trees.

A wide river.

Dongers.

Hills to st. apparently  
limestone, track at base of  
cliffs. Large river (Rhône?) to  
left. Open pine forest on  
some of hills.

Hills also on other side of river,  
quite close.

Mostly thin scrub covered,  
except for dense scrub on  
talus and some patches of  
open pine woods.

Then a large flat valley -  
grain fields, hedges & wind breaks.  
Immense cement plant or  
something of the sort.  
Bar to left, cutting into hill.

Large canal.

Monteliman.

Low agricultural land. Hedges  
and rows of willows.

Terraces to right, with scrub  
forest of *Quercus* or *Ilex*.

Broad river, little level land  
on right. Hills densely wooded.  
Valley with ~~abundant~~ abundant  
poplar and other trees, agriculture,  
orchards.  
Valence.



Agricultural land - meadows, grain, vineyards, etc with many hedges and trees.

Then a rather dissected terrace with grain fields, orchards, (only edge dissected) some small rounded hills on left, partly wooded. Some hedges but not many. Very few vineyards, but orchards still common - more grain than anything.

Fair sized river - dirty water. wooded ravine sides. Isère Romans.

Flat agricultural country. mostly grain. A few vineyards. Some rows of trees - Platanus.

The river of dirty gray water again on right.

Country suddenly rather rugged. Dissected higher plateau. River has wooded bluffs. Wooded country. A dam in the river.

Agriculture above dam on left side. Range of rugged hills on other.

Rolling valley - several terrace levels along river. Oaks forest on breaks between terraces. Terraces agricultural. Many trees. Spectacular mountains in distance to

right.

Orchards, hay fields, (alfalfa).

Hills to left mostly pasture, some small woods.

Valley narrows rapidly. Many ravines. These wooded. Robinia abundant.

Mts. on other side of river, & right, very abrupt, mostly wooded. Valley floor in agriculture with many trees, locally like an open forest. ~~W~~ Walnuts? Yes.

Hills on left rather high, partly wooded.

Large areas of walnut orchard.

Valley bottom flat, sides high, wooded. Poplars are abundant in valley bottom, meadows. Walnut orchards. Widens out somewhat.

Tullins - Tires

Valley widens more. Meadows and some grain. Many poplars. Hills on left lower. Mts on rt. higher. Walnuts have disappeared. Moirans.

Large flat area. grain, some vineyards. Many trees. Pastures. abrupt mts. again on left and right, with great cliffs.

Flat valley bottom with meadow vineyard, poplars.



cliffs of great sedimentary beds dipping in direction train is going, eastward to opposite. Flat valley bottom, fairly wide. Vines upon vines.

Slopes of mts. on both sides below cliffs partly wooded, partly grassy.

Grenoble.

Leaving Grenoble, large snow covered mt. visible to rt. City and valley surrounded by high and abrupt mts.

Valley is flat, densely settled. Intensive agriculture - strips, trees, vines on trellises, gardens.

Steep sides wooded. High cliff on left. Valley continues as above Grenoble. Finally fields and meadows, with hedges, predominate.

Rancey

Above Rancey much heavy industry locally.

Flat valley bottom with meadows, hedges, trees and gardens.

Strikingly serrate range to left.

Some parts of valley floor quite wooded.

Goncelin.

Valley widens some.

Lower slopes mostly pasture.

Valley widens out very conspicuously.

Meadows, gardens, rows of trees, grain fields.

Snowy peaks to rt. a striking cliff to left.

Montmélian.

Vineyards on lower slopes, scrubby woods above this, on rt. Open rolling pastures and meadow on left. Valley very wide.

Becomes rolling hilly, perhaps a dissected terrace. mostly pasture, <sup>meadows</sup> and grain.

Valley narrower somewhat again.

Chambery left.

Valley flat <sup>left</sup> rolling hilly to right. agricultural but trees abundant. Patches of woods, rows, hedges, orchards.

Valley fairly wide but rolling hilly.

Aix les Bains.

A large lake on left, surrounded by steep ~~with~~ mts. Lower slopes cultivated where they are not cliffs. Mostly bushy or wooded.

Valley widens above lake, quite flat.

Divided by an abrupt range of hills.

Cross large river (Rhône?).

Culoz.



Train reversed direction at Calog.  
 Flatterish, poorly drained  
 valley with willow thickets,  
 marshes, meadows, gardens etc.  
 Becomes sparsely wooded  
 and brushy.

~~But~~ we are following the  
 Rhone, but it is on the right  
 side.

Rolling grassy hills.

Dam, backing up Rhone to  
 form a reservoir.

Hills wooded.

Some rolling valley and  
 low hill land in meadows  
 and grain, hills <sup>mostly</sup> wooded.

Collegarde.

Lower slopes in grass and  
 gardens.



June 3 - Jura mts.

Open to closed forest of  
Abies, Picea, locally Fagus -  
somewhat logged.

- Vaccinium myrtillus*  
very abundant locally,  
a thick herb layer -  
Lg *Dryopteris filix-mas*  
Lg *Pteridium aquilinum* - ferns  
c *Dentaria* white & purple  
c *Viola*  
La *Anemone* sp.  
n *Stellaria*  
o *Thalictrum*  
o *Anemone*  
c *Primula*  
La *Tussilago*  
c La *Oxalis acetosella*  
c *Veratrum*

much moss on ground  
and bases of trees  
many lichens on twigs.  
2 photos (694) with *Tussilago* in fr.

June 3 Valsérine

a U shaped valley  
fractured on lower slopes  
and in bottom, Picea forest  
on slopes.

Pasture on slope with  
abundant *Trollius*,  
*Cynisectum*, *Gentiana flavo*,  
*Orchis maculata* (sp.)  
*Potentilla*, *Polygala*, *Carex*,  
*Alchemilla*.

locally *Valeriana*, *Anemone*,  
*Caltha*, *Geum*, *Pinguicula*.

June 4. Valsérine above Chézery  
Défilé des four Palmes  
limestone cliffs with  
crinoids, ferns, Saxifrage  
aizoon, lagina.

talus with broad leaf shrubs  
incl. *Laburnum*. (in fl.)

La Rivière - below tunnel  
Meadows of incredible  
richness in flowers.  
*Tragopogon*, *Rhynanthus*, *Chrys*,  
*Aquilegia*, *Valeriana*, *Trisol*,  
*Galium*, *Myosotis*, *Lotus*,  
*Plantago*, *Centaurea*, *Polygonum*,  
(photos - 695)



June 3 - Valserine, just below  
Mijoux

41030

*Equisetum*

common in sloping meadow  
and in edges of spruce forest.

31 *Carex*

in deep moss on rock  
in edge of woods

32 *Asplenium viride*

June 3 - slopes of Mont Rond  
above Col de Faucille

33 *Asplenium viride*

on bank along trail in  
Pines - Abies - Fagus woods.

34 *Asperula*

common in Pines - Abies - Fagus forest

35 *Globularia*  
very local

June 4 Defile de Lour Balme,  
Valserine, above Chazery

36 *Thelypteris robertiana*

rare in crevices in limestone cliffs

37 *Asplenium ruta-muraria*

rare in crevices in limestone cliff

38 *Veronica*

limestone canyon

June 4 - La Riviere, above Chazery,  
Valserine,

39 *Orchis*

meadow

(To m. 190)

975 m.

erect, spike pendent.

inflorescence blackish.

1350 m.

erect from prostrate rhizome,  
flowers white.

1350 m.

forming mat, flowers  
violet.

flowers lavender.

pendant pink, lip deep  
cinnamon. rhizome bulbous.



just below Faens

Below Chery -  
limestone talus with  
Sedum sp. Rumex, Galium  
mollugo, Chrysanthemum  
Scrophularia, Anemone  
avena, Helleborus, Prunus  
Cornus, Ranunculus, Silene  
Ranuncus (??).

Flats at bottom with  
Euphorbia, Silene, Anemone (?)  
Geranium robertianum, Galium  
Medicago, Scrophularia  
Orchids in woods.

Lower below Champagnier  
Montagne, etc. The valley widens  
becomes brushy. Even some  
low Buxus scrub.

Toward Nantua -  
Picea forest again.

Above Nantua. Spruce  
replaced by small Pines sylvestris

W. of Nantua

Limestone slopes facing  
east - close short grass,  
scattered patches of open  
small pine, with traquila  
open shrub layer of Juniper  
Prunus spinosa, Cornus,  
Viburnum lantana. Buxus

Quercus  
pubescens

700 m.

photos (b+w.) & Kod (Ananthus).  
Blue Salvia & magenta  
Ananthus in meadows.

Beyond Col de Berthier  
generally a parts-land of  
grass scrub, scrub forest - G.  
pubescens, etc.

Limestone cliffs across  
the Ain R.

B Buxus scrub on south  
slopes.

~~Buxus~~ sericea.

Gorges de l'Ain - lower part  
a brushy landscape - a very  
mixed scrub, much Buxus,  
Prunus spinosa, etc. steep  
slopes. Gentle slope in  
grass pasture. In place  
looks badly overgrazed on  
steep slope - probably by  
sheep or goats. (none seen).

& photos (Kod.) of limestone cliffs.

above Courmayeur 1 km. above Moux  
slope with grass and open  
Juniper scrub, dwarf scrub  
of a heathy - like sterile plant. (a legume).  
several orchids. Thin soil. limestone.

Photos (b+w.)

Below Uffel

limestone rocks (photo-b+w.) w.  
Sedum, Asplenium 3 sp. Fagius.  
mosses.

above  
Courmayeur



R. Ain n.e. Carron <sup>below Chartreuse de Vaulchère</sup>  
 a curious very dense  
 small Fagus forest.  
 with some Quercus, Carpinus,  
 Acer campestre, almost  
 no undergrowth. Hedera  
 on ground, thin. locally  
 much Convallaria.

Small abies planted  
 below

Ancienne Chartreuse de  
 Vaulchère

photos (herb.) of ruin, her-  
 bow. of flowering meadow  
 + wooded bluff.

Chartreuse de Vaulchère

photos. new 1775 old 1119

ferns in walls

Lower story a series of semi-  
 underground chambers each  
 with an arched door to the river,  
 ferns growing on arches,  
 a yonation of plants inward  
 from doorway with diminishing  
 light, a band of Marchantia (?)  
 last inward.

Construction of limestone.  
 Ferns deeply rooted in crevices.

Photos of church in Orgelet  
 & querc near Tour de Meis

near Cognon

a depression in limestone  
 plateau, surrounded by  
 meadow and irregular  
 bushy scrub. The depression  
 has a thin ~~scrub~~ dwarf scrub  
 of Calluna vulgaris,  
 several legumes, grass, etc.  
 The interesting thing is the  
 patch of Calluna in the  
 limestone. No hummocks.  
 Is a filled sink hole.

560 m.

Near Louisa 2 km. s. of  
 rolling plateau of  
 limestone with thin soil.  
 juniperus <sup>shrub</sup> savanna with  
 Lotus, Carex and various  
 orchids, Euphorbia in grass.  
 scattered small Betula  
 about 7-4 m. Juniperus 0.5-2 m.

Lac de Warley

photos (herb. & herb.) of rich  
 meadow with fls. ~~at~~ of lake.

~~Phytolacca~~ Rhinanthus 2 sp.  
 Datura 1.

Onobrychis?

Prunella (large fls.)

Lotus

Crepis?

Chrysanthemum leucanthemum

Trifolium pratense

Beta

P. canisago scabiosa



Lactuca  
typical1410-41  
460-41June 4 - just below Forens, below  
Chezy, Valserine

Cephalanthus

in woods on limestone

42 *Orchis montana*

in woods on limestone

June 4 La Rivière, above Chezy  
Valserine43 *Galium*

common in meadow

typical

June 4 - west of Nantua

43 *Dianthus*common in <sup>my</sup> sloping meadowJune 4 - 1 km. above Moiré,  
above Courtoisville, Ain R.44 *Melilotis melissae*

common on cut bank above road

45 *Ophrys*rare in sloping meadow  
on limestone, with *Juniperus*46 *Ophrys muscipula*rare in sloping meadow  
on limestone with *Juniperus*June 4 - Ain Valley below  
Charnia47 *Lagotis*

on limestone rocks

flowers pale cream color

flowers white

Ain

712 m

erect from rhizomes,  
flowers white, very  
aromatically fragrant.

Ain

flowers deep crimson.

Jura

flowers white

sepal whitish, petals  
pale pink, short, brown lines,  
lip almost black, column  
green, appendage pointing forward.  
lip very dark.

Jura

flowers white, 4 petals +  
stamens, 2 styles.



Cahiers  
Lignier

June 4 - Chartreuse de Vaudaise  
Ain Rives  
in crevices in <sup>limestone wall of</sup> 12th century  
ruined abbey

41048 *Asplenium ruta-muraria*  
common

49 *Thelypteris robertiana*  
rare

50 *Asplenium trichomanes*  
common

June 4 - 2 km. s. of Bourcin,  
south of Clairvaux de Bass  
on rolling grassland  
with thin soil on limestone,  
scattered juniperus

51 *Orchis*  
rare

52 *Piparis*?  
occasional

53 *Orchis montana*?  
common

June 4 - Cognon, e. of Argeles  
54 *Cytisus*?  
very common in and around  
a heath-like depression  
in rolling limestone plateau

June 4 - Cascades de Herisson  
north of Bonlieu  
55 *Taxus baccata*  
rare in woods below Cascades  
along Herisson R.

Tura

Tura

flowers pinkish,  
buds blackish maroon.  
flowers green

flowers white, little odor.

Tura

flowers bright yellow.

Tura

small tree about 5 m. tall,  
crown spreading.



May 5 - n.w. of Lac de Chalain  
broad rolling valley,  
very green, scattered  
cultivation, mostly  
pastured, a few trees,  
like a great park.  
Surrounded by wooded  
ridges - mixed Fagus  
and other deciduous trees.  
Les Beaulieu

Cirquede la Baume - an  
enormous box canyon  
cut in the limestone plateau  
vertical cliffs with talus  
slopes at base - junipers  
wooded, cliffs bare, talus  
mostly grassy, some  
bare and loose, scattered  
trees. (photos by G. & Rod.)

Woods at head - Tilia,  
Quercus, Carpinus, Fagus.  
Evidently originally a  
collapse feature.

Talus at head of valley wooded.  
A series of these "cirques" form  
reentrants in the edge of  
the calcareous Jurassic  
plateau wherever rivers  
emerge from the cliffs.

Fraxinus excelsior very  
common, also Malus sp. (?)

In crevices Asplenium  
trichomanes reaches great size.  
Cystopteris, Chelidonium, Geranium

robertianum, Melica (?),  
Elinia (???), Bromus, Anolis,  
etc. Trilix (?), Urtica

Rather extensive cave  
at head - excellent  
illustration of crevices  
hollowed out by water -  
series of chambers in  
striking Gothic style.  
Pools with blind crabs  
(or shrimp?). Many bats.  
Much water when  
there is rain on the plateau.

Meadows on steep talus -  
with Thelypteris, etc.  
Aquilegia, Orchids (only below  
trees).

A labyrinth of canyons  
cut in the Jurassic plateau.

(near Chaux-de-Fort)  
Crotenay - (Lilac or roadside.)  
Much low dense second  
growth forest with scattered  
larger trees. Logging going  
on locally.



June 5 - Forêt de Joux  
Senter de Glacière

Open forest of Abies and  
Picea. trees to 50 m. high,  
varied in diam. but to at least  
125 cm. dbh.

Ground covered with  
limestone boulders,  
shrub layer of *Lonicera*,  
*Sambucus*, *Chrysothrix*, *Rubus*,  
*Asperula*, *Hedera*, *Phlox*, *Oxalis*.

In places *Athyrium* completely dominant.  
Much thick moss over boulders.

Bases of trees actually  
growing around limestone  
boulders.

(Photos to W.)

Much moss and some  
lichens on trees - esp. on  
lower branches. some in trunks

Some small *Lagotis* here and  
there.

June 5 - Salornay

sloping meadow on thin  
soil over limestone.

2 km. n. of Salornay  
scattered patches of  
*Buxus*.

Grass with some other  
herbs. *Orchis pyramidalis*  
~~very~~ common.



*Colinus*  
*typus*

June 5 - Cirque de Baume

in limestone crevices  
41056 *Cystopteris fragilis*  
occasional

57 (green) ~~Walt~~ *Milium vernale* M. B.  
common

58 *Linaria acutriloba*  
common

on steep limestone talus  
59 *Thelypteris robertiana*  
abundant locally in  
herbaceous vegetation

June 5 - Crotenay, near  
Campagnale

60 *Ornithogalum pyrenaicum* L.  
very common along <sup>open</sup> roadside  
in woods, also seen  
under trees

June 5 - Salornay  
in sloping grassy meadow

61 *Orchis pyramidalis*  
occasional

62 *Galium mollugo* L.  
common

June 6 - Moulins (Allier)

63 *Phlomis fruticosa* L.  
growing in garden (brought  
from des Fle Hiers, Vannes)  
d. H. Jones Van Dyke

Jura

somewhat caespitose

creeping

rhizome buried.

Jura

erect, flowers pale green,  
leaves dried at flowering time

Saône et Loire

flowers magenta

stems erect, flowers  
white.

flowers canary yellow.



July 4 Great Falls

Flowering

*Lysimachia ciliata*

*Cincaea quadrangulata*

*Cryptantha canadensis*

*Hystrix*

*Geum canadense*

*Clypeus virginicus* ?

*Campsis*

*Erigeron strigosus*

*Galium oblongifolium*

*Trifolium repens*

*Rumex obtusifolius*

*Juncus tenuis*

*Plantago rugelii*

*P. lanceolata*

*Chrysanthemum leucanthemum*

*Polygonum persicaria*



Relief of 300', 535' alt at Southern Pine  
300' drop to where Connecticut crosses James Creek

July 8 Low Chen Pine  
Boyd Tract. James Creek Drainage  
Stump of pine about 18" diam  
12" from ground 63 rings.  
probably *P. taeda*, as most  
of nearby ones are.

Mosaic of hardwood  
forest with a few pines,  
on low ground, and pines  
with a few hardwoods  
on higher ground. A  
mixture of *P. taeda* and  
*P. australis* on the higher  
areas, rather sparse,  
5-10 or 15 m. apart, mostly  
3-4 dm dbh. perhaps 30 m.  
tall, or more. A few large oaks.

Well developed understory  
of *Cornus florida*, *Quercus* sp.,  
*Biospyros*, *Oxydendrum*,  
*Ilex opaca*, *Ilex* sp., *Carya* sp.  
etc. *Liquidambar*  
about 3-6 or 7 m. tall,  
not forming a closed  
layer

In opening 15 m. across  
~~young~~ *Pinus taeda*  
seedlings 1.5-2.5 m. tall  
2 cm. thick, 1.5-10 dm apart.

Then herb - ~~layer~~  
a dwarf shrub layer

quite intermittent -  
in places dense (*Vaccinium*-  
*Gaylussacia*), in places  
absent, where pine needles  
are thick and *Cornus*, etc.  
are closed.

Scattered cutting bar,  
near highway, trees 3-4 dm.  
light pine reproduction  
in more open spots.

Soil pine, sandy.  
Needles to 7 cm. ± thick.

Canopy of pines  
scarcely developed.

A curious form of  
*Rhus toxicodendron* with  
narrow, lobed leaves,  
locally common, esp.  
in more open areas.

*Vitis rotundifolia* common,  
mostly creeping on ground.

*Arundinaria tecta*  
locally, but more in  
hardwood areas.

Some stumps in a  
heavily cut area 3-11 dm  
near ground.

*Callicarpa*



Lower ground has open broadleaf forest with a few pines. Mostly *Liquidambar*, *Acer rubrum*, *Pinodendron*, *Oxydendrum*, *Quercus falcata*, *Q. stellata*, *Magnolia virginiana*, up to 30 m. tall, but irregular, no very distinct layers, trees varying to shrubs. Seedlings & sprouts and shrubs thick, *Arundinaria* local.

Some small oak forest even on higher ground, with admixture of pine, with stumps of very old cuttings. Some *Carya*.

Swampy spots along small streams.

On higher ground open very tall pine to 40 m. with irregular but rather dense, locally ~~second~~ <sup>second</sup> story of *Quercus*, *Liquidambar*, *Carya*.

Discernible understory of *Cornus*, *Liquidambar*, *Quercus*, *Prunus serotina*, 192 m. tall.

Along creek dense small hardwood swampy forest, trees to 25 (30?) m. none larger than 2.5 dm understory thick, shrub layer thick, some *Sphagnum*.

In n.w. corner there ~~are~~ some tall dense forest of oaks and other hardwoods.

South of this some nice pine woods 3-8 m. tall spacing 30-35 m. tall was thinned a bit 5-6 years ago. Thin irregular understory of oaks, some wood, *Cornus*, *Ilex opaca*, etc.

Thinning with patch of *Sphagnum* and *Woodwardia areolata* below it. ~~It~~ Good flow of water, even after having no significant rain for some time. Alders. ~~It is~~

Pine with some large oaks, usual understory of *Cornus*, *Diospyros*, *Quercus*, etc. along back of open field  
see p. 143.



1960

3 mi. n.e. North Carolina

3 mi. from Southern Pine -

Moore County Hunt Club -

Seepage bog, 15-20 acres,  
in "bayhead", with  
*Dionaea*, *Sarracenia* 3 spp.  
*lutea*, *flava*, *rubra* -  
*Drosera*, *Pinguicula*,  
*Utricularia*, etc. *Sphagnum*.

Open pine land with  
*Quercus marilandica*  
and Turkey oak

Low area along stream  
filled with a tangle  
of *Ilex glabra*, *Myrica*  
*virginiana*, *Rhus*  
*vernix*, *Clethra*,  
*Rhododendron*, *Arundinaria*

Tangled with *Smilax*  
*laurifolia*

Open spots with  
*Sabbatia*, *Sarracenia*  
*flava*, *Sphagnum*  
*Eriocaulon*, *Rhexia*,  
*Xyris*, *Samolus* *regalis*,  
*O. Claytonii*? *Lycopodium*  
*carolinianum*

W O Moss

Mile-Away Farms

So. Pines

Moore Co. Hunt Club

on  
young's Rd.  
on mi  
past  
mile-away  
farm

old  
noted  
Academy

even  
left on  
left rd.

Carroll's Branch  
swampy area along  
stream - swamp forest  
with dense undergrowth  
of *Ilex coriacea*

Cliftonia

Persea

Pieris nitida

Nyssa:

*Rhododendron viscosum*?

(Woods will send me list.)

John Watson - large tract  
near Southern Pines, with  
90 acre lake, etc.

Very diverse

half way bet. Southern Pine  
& Pinehurst.

might be of interest  
for summer biological  
station (Frank Woods)  
probably for sale. Watson  
is retired inventor,  
well-to-do, lives in N.Y.



July 9 - Southern Pines Boyd tract  
 irregular  
 ground layer  
*Vitis rotundifolia*  
*Andropogon*, seedlings  
 of trees, etc.

*Gaylussacia frondosa*  
 and *G. baccata*. *Rhus*  
*toxicoendrium*.

Quite a few logs rotting  
 on ground.

All this has been thinned  
 5-7 years ago.

About 70% *P. taeda* and  
 30% *P. australis*. A little  
*P. virginiana*.

Low area near stream,  
~~flooded~~ flooded in  
 wet parts of year, formerly  
 a few scattered very  
 small pines mostly  
*Q. rubrum*; some  
*Liquidambar*

Understory very  
 irregular, very dense  
 locally

Some trails

A little *honey-suckle*.  
 Locally the *Pinus*  
*australis* has been tapped  
 for turpentine.

Some area on fairly  
 high ground a mixture  
 of oaks (*Q. marilandica*,  
*Q. stellata*, *Q. imbricata* (?),  
*Q. falcata*, *Q. velutina*,)  
 and pine. 15 m. + tall,

fairly dense, some  
*Asplenium*, *Cornus*,  
 result of old logging.

two old sawmill sites nearby.

Southern Pines only about  
 60 years old. Older town  
 just north Manley,  
 was burned out by a  
 forest fire.

Swamp of alnus.  
*Lambucus*, *Liquidambar*  
*Liriodendron*.

Handy ridge 6-15 m  
 covered by open stand  
 of *Pinus australis* and  
 turkey oak. Pines 20 m.  
 or so tall, 5-20 m apart.  
*Quercus* 3-4 m. tall.  
 crowns touching to spaced  
 about diameter of crowns.

Very thin herb ~~layer~~.  
 Dwarf shrub layer  
 with some grass, some  
*baccharis*, etc.

Fine white sand  
 with deep to shallow



pine needle litter.  
Locally *Q. marilandica*  
replaces *Q.* — . or  
mixtures.

On top of ridge the  
pines are much smaller  
10-15 m. tall up to 20 cm dbh.  
One bored about 15 cm. thick  
was about 43 years old.

Here the trees are 2-4 m.  
apart, but with  
very well marked  
shrub layer of the oak,  
principally turkey 2-3  
m. tall. Dwarf shrub  
herb layer very sparse.

A bring in a 3 dm.  
tree showed about the  
same age.

Turpentine tapping 9-7  
years ago, worked for only  
2 years.

No fire in perhaps 20 years,  
but bark of some trees  
show slight evidence  
of charring.

White sand is up to  
13 m. deep, in places  
and loamy sand comes  
to surface.

air photo ACQ-26-70

Platanus in this area  
said by Mr. Goldsmith to  
be descended from trees  
brought to his house  
by his wife's ancestor  
(Monroe - Shaw) from  
eastern part of state  
many years ago.

Pine woods near  
Goldsmith house  
rather open, with  
dense undergrowth of  
*Cornus*, *Myrica sylvatica*,  
*Quercus*, *Liquidambar*, etc.  
tangled with *Vitis rotundifolia*.  
Quite a lot of *Lonicera japonica*  
on road. (Connecticut Ave.)

For preserve, could  
exclude strip along  
Connecticut Ave. except  
north corner from edge  
of cleared area to Bethesda  
Ave, and in whatever a  
reasonable distance (200 yards?)  
perhaps tapering off eastward  
along edge of swamp.

Perhaps a strip to depth  
of the narrow cleared field,  
thus including the eastern  
cleared field, leaving western  
cleared field in reserve.



July 9 - ~~Madison~~  
Rocky River -

7 mi.  
~~at~~ south of Pittsboro  
steep slope on ~~at~~ south  
side of Rocky River.

Mixture of Acer -  
Fagus, Pinus strobus,  
Quercus prinus, Q. alba,  
Q. rubra (2)  
Cornus florida,  
much Rhododendron  
catawbiense, Viburnum  
rifidulum, V. acerifolium,  
Kalmia latifolia,  
Acer rubrum, Oxydendrum,  
Euonymus americana,  
Ilex pauciflora  
Polystichum acrostichoides  
Epigaea repens, etc.  
(Woods will send me list)

Maxwell  
Frank Woods & McCormick say  
there is another stand  
of same mixture with  
~~that~~ Pinus strobus on  
s. side of Deep River about  
4 mi. west of Monroe.



Collected  
by [unclear]

- July 9 - 7 mi. s. of Pittsboro,  
on south side of Rocky River  
in thick broad-leaf forest  
with some *Pinus strobus*
- 41064 *Galium circaeazans* Michx.  
uncommon
- 2 65 *Viburnum infidulum*!  
uncommon
- 1 66  
local on steep slope
- 2 67 *Epigaea repens*  
common on steep slope
- 3 68 *Acer nigrum* var.  
co-dominant -
- 1 69 *Pinus strobus*  
common, especially  
seedlings and saplings,  
which are growing in  
shade.

July 9 - Carroll's Branch,  
about 3 mi. n.w. of  
Southern Pines  
in thick swamp in  
creek bottom land.

- 1 70 *Nyssa*?  
occasional
- 2 71 *Cliftonia*  
occasional
- 1 72 *Cliftonia*  
same
- 3 73 *Ilex coriacea*  
abundant

stem nearly erect.

shrub; sterile.

sterile

prostrate

small tree with  
several stems.

tree 1.5 m. tall (cones),  
leaves from seedling  
1.5 m. tall.

Moore Co.

small sterile tree  
6 m. tall.

small tree or large shrub;  
flowers white, fragrant.  
same; sterile

shrub 1.5 m. tall; fruit  
immature.



41074 *Persea borbonia* f. *pubescens*  
common

July 7 - head of small  
brook, Carroll's Branch,  
3 mi. n.e. of Southern Pine  
in ~~big~~ brushy bog  
fed by seepage

75 *Dioscorea muscipula*  
rare, in small opening,  
crowded by grasses, etc.

76 *Cyrtilla*  
occasional

77 *Aletris*  
occasional in open  
places

78 *Lycopodium carolinianum*  
very common in openings

79 *Lachnanthes tinctoria*  
rare in openings

80 *Acer rubrum* var.  
common

July 7 just east of Southern Pine  
James Creek drainage  
in open pine woods on  
low sand hills

81 *Pinus australis*  
dominant

82 *Aneilema*  
rare, tuft at base of pine tree

83 *Rhus toxicodendron* var.  
common locally

shrub 3-4 m. tall; aromatic;  
leaves glaucous beneath;  
sterile.

leaves closing when  
touched.

shrub 0.8 m. tall,  
leaves somewhat glaucous  
beneath.

ascending; stems  
- fistulose; rhizomes thick.  
- roots orange red,  
- flowers pale greenish white;  
shrub 3 m. tall; sterile.

small tree

caespitose; petals  
- bright pink.  
- erect; leaves appearing  
stiffish, dark reddish green;  
fruit immature. "poison oak"



- 4184 *Stipulicida*?  
common in open spots  
~~87 *Pieris vitida*~~  
85 *Galium*  
rare  
86 *Pieris vitida*  
common in moist spots

Aug. 10 -

- Elkins  
87 ~~*Galium latifolium* Michx.~~  
occasional in rather thin  
second-growth hardwood forest  
on rather stony slope  
88 ~~*Butyrachium dissectum*~~  
yes in second-growth hardwood  
forest on gentle slope  
89 ~~*Galium cuneifolium* Michx.~~  
rare in plain hardwood  
forest on steep slope.

flowers white.

ascending

shrub 1 m. tall.  
leaves glossy above.

~~stem ascending~~

~~stem ascending~~



Aug. 2 - 1.4 mi. <sup>Midam Gap</sup> S. of Big Meadows  
weedy meadow along  
Lynchburg Drive, scattered  
small trees

Dense patch of yellow  
flowered *Galium* sp.

Rhizomes form a solid  
mat about 3 x 4 m.

with sterile shoots  
1-1.5 dm. tall looking like  
*Linaria vulgaris*, fertile  
shoots up to 4-5 dm.

Tall.

Solid patch of *Rudbeckia*  
*laciniata* in seepy places

5410 37 *Galium* ~~sp.~~ *verum* ~~sp.~~ *verum*  
very local, dense patch

1 38 *Botrychium multifidum*  
rare, edge of meadow, roadside

2 39 *Hypericum punctatum* Lam.  
local in meadow

Aug. 2 Crow Hollow, ~~East~~  
South Branch Naked Creek,  
E. of Piney Mt.

Hemlock - white pine grove,  
with *Quercus coccinea*, tulip, etc.  
*Mitchella*, *Polygala* sp.?  
*Chimaphila maculata*,  
*Gaultheria*, *Polystichum*, etc.  
common under trees. *Lindera*  
*benzoin*, ~~common~~ common in  
undergrowth. *Pinus* and  
*Tsuga* seedlings common

3230'

below road.

*Clematis virginiana*  
in flower. *Centaurus*  
*maculosa* abundantly  
in flower. *Asclepias*  
*syriaca* in flower.

Locust and hawthorn  
invading abundantly.  
*Rubus* (dewberry) forming  
abundant patches

stems erect from buried  
rhizomes, flowers yellow, ♂.  
frond flat on grass.

flowers yellow.

1700'

in medium shade.

*Platanus* common  
around edges.

Clearing just above  
with ruins of old  
house site. *Gleditsia*  
abundant. *Pyrus communis*,  
*Buxus*, *Pyrus malus*  
persisting.



✓ Aug. 2 - Crow Hollow, S. of  
Piney Mt., South Branch  
of Naked Creek  
in Hemlock-white pine grove  
in flat valley bottom.

41090 *Polygala pauciflora* Willd.

1 locally abundant

2 91 *Mitchella repens* L.  
abundant

2 92 *Galium triflorum* var. *asprellifolium* Fern.  
local near stream

1 93 ~~Cystopteris~~ *Woodsia obtusa* (Hb.) Torr.  
rare on bank above stream

2 94 in old clearing  
*Symphoricarpos orbiculatus*  
common along roadside

4 95 *Gleditsia triacanthos* L.  
common, one large tree  
and ~~many~~ <sup>many</sup> younger ones

2 { 96 *Morus nigra* L. <sup>rubra</sup> <sub>var.</sub>  
97 persisting <sup>rubra</sup> <sub>var.</sub> <sup>4 more</sup>

1 98 *Pyrus communis* L.  
persisting

2 99 *Buxus sempervirens* L.  
persisting

✓ Aug. 2 Hazel Top Ridge Overlook  
41100 *Sisymbrium officinale*, *leucanthemum*  
weed in trampled place

sterile, spreading  
by slender white rhizomes.  
prostrate; fruit  
immature.

stem reclining, slightly  
retorse scabrous.

shrub, flowers white.

young tree about 7 m. tall;  
bipinnate leaves near  
tips of lower branches.

small tree with  
strongly ascending  
branches, sterile.

tree 8 m. tall.

small well-formed  
erect tree 5 m. tall.



✓ Aug. 2 - Dry Run Falls  
in densely wooded flat  
bottom of ravine partly  
filled with broken rocks,  
~~many~~ crevices filled  
with humus

41101 *Goodrya pubescens* (Willd.) R. & S.  
rare

1 02 *Carex laxiflora* Lam.?  
rare

2 03 *Caulophyllum thalictroides*  
locally common

2 04 *Botrychium virginianum*  
~~rare~~ abundant

2 05 *Festuca obtusa*  
along trail  
occasional

✓ Aug. 2 - below Dry Run Falls  
along old weedy road in  
densely wooded gentle slope

4 06 *Polymnia canadensis*  
local

2 07 *Galium circaezans*  
local

2 08 (Lab.) *Melissa officinalis* L.  
locally common

3 09 *Muhlenbergia tenuiflora* (Willd.) B. & P.  
occasional in trail

2 10 *Galium triflorum* Michx.  
occasional

2 11 *Phryma leptostachya*  
occasional

2450'

leaves gray-green with  
white veins; flowers white.  
leaves glaucous,  
slightly crisped  
fruit green.

flowers pale yellow.  
roots <sup>and rhizomes</sup> yellow.

flowers very pale lavender.  
erect.

flowers pinkish.



166 1960 Virginia

4/11/12 *Agrimonia macrocarpa* Wallr.  
occasional

1 13 *Viola*  
common

2 14 *Plantago*  
occasional

✓ Aug. 3 - east slope of Mary's Rock  
in *Quercus prinus* - *Quercus rubra*  
forest on broken rocks

2 15 *Spiraea betulaeifolia* f. *campii* Torr.  
common

3 16 *Dryopteris*  
rare

3 17 *Digitaria sanguinalis* (L.) Scop.  
local in trail

3 18 *Aureolaria laevigata* (Raf.) Raf.  
occasional ~~along~~ on eroded slope

2 19 *Carex radiata* (Wahlenb.) Deroy  
common along trail

3 20 *Hieracium paniculatum*  
common

3 21 fern)  
local

2 22 *Carex virescens* Muhl.?  
occasional on edge of trail

2 23 *Gaylussacia baccata*  
common in patches of scrub  
oak.

✓ Aug. 3 - Pass Run w. of ~~Phonetic~~ *Phonetic* Gap

1 24 *Lespedeza curvata*  
abundant on road cuts and embankments

Shen. Nat. Park 167

erect, flowers yellow.  
leaves erect

from exact type locality  
of f. *campii*.  
bracts ascending  
from caudex.

erect, several stems  
from base; flowers yellow,  
corollas caducous in  
late afternoon.

flowers yellow

loosely tufted,  
culms ascending.  
shrub 0.5 m. tall;  
fruit black, juicy.

herb up to 1 m. tall; sterile.



Aug. 3 - Mary's Rock

East slope is a talus of huge boulders of

Forest is rather dry, well drained, of *Quercus prinus*, *Q. rubra*, with a thin shrub layer of *Kalmia latifolia*, some *Menziesia*, scattered *Acer pensylvanicum*, some *Vaccinium vacillans*, *Spiraea betulacifolia*.

Upward this becomes more moist, *Rhododendron*, ~~Moss~~ *Menziesia*, *Hydrangea*, etc. become more abundant, as do ferns, esp. *Dennstaedtia*.

A patch on the upper slope covered by scrub of *Kalmia* and *Quercus ilicifolia*, some *Castanea* sprouts, *Gaylussacia*, *Vaccinium*, etc.

The summit covered by *Pyrus americana*, *Quercus*, etc. *Diervilla*, *Saxifraga nuchauxii*.

*Dennstaedtia* in crevices on rock cliffs on west side.



Aug. 3 - top of Marys Rock  
on great rocks, with  
thickets of *Pyrus americana*

41125 *Saxifraga michauxii*  
common in crevices and on ledges

2 26 *Betula lenta*?  
on ledges

1 27 *Maianthemum canadense*  
local colony on exposed  
mossy crest.

2 28 *Pennstemon punctilobus*  
abundant in crevices,

✓ Aug. 3. - Hemlock Spring  
seepy place above  
Hy-Line Drive.

3 {29 *Acer nigrum* var. *glaucum*  
30 common

1 31 *Thelypteris dryopteris* (L.) Flosson ex Ryth  
rare

4 32 *Athyrium filix-femina* f. *rubellum*  
common

2 33 *Eupatorium purpureum* L.  
common

1 34 *Hypericum*  
common

2 35 *Juncus affusus*  
in mud

flowers white.

shrub 1 m. tall, strong  
wintergreen odor, bark  
dark brown; wither brown.  
sterile; rhizome  
buried.

regulate where exposed,  
plane where sheltered.

925 m

lower branches of small  
slender tree; sterile.  
leaves rather glaucous  
green beneath.

rachis reddish.

erect herb 1-1.5 m. tall  
stem purplish, solid;  
heads dull lavender,  
corolla lobes purple. styles  
white.

flowers ~~yellow~~ dull yellow.

small tufts; culms  
weak.



41136 *Athyrium*  
rare

1 37 *Habenaria viridis*  
rare

✓ Aug. 3 - 1 mile east of Big Meadows,  
head of Rapidan Fire Road  
in grassy openings in  
second growth thicket.

2 38 *Trifolium agrarium*  
common locally

2 39 *Solidago juncea*  
common locally

2 40 *Aster*  
common

2 41 (cl.) *Melanthium hybridum*  
occasional

✓ Aug. 4 - South River Cemetery  
in weedy overgrown cemetery

2 42 *Monarda fistulosa* var.  
common

2 43 *Rhamnus*  
common

2 44 *Monarda didyma* ?  
common

1 45 *Miscanthus sinensis* f.  
two clumps among many normal

fronds ascending

erect; corolla dried

stems reclining;  
corolla yellow.

flowers bright yellow

several stems from  
base; rays white,  
disk purplish.

erect; petals white,  
odor musky-sweet.

9 am.

flowers deep magenta,  
lower lip mottled with  
maroon, with a central strap-like  
oblong <sup>bifid</sup> lobe, & very much  
shorter rounded lateral ones.  
sterile virgata shoots

1-1.5 m. tall from caudices  
and rhizomes which have  
once been grubbed out or cut.

flowers <sup>deep</sup> scarlet, lower lip  
trilobate, middle lobe much longer.

Caespitose, leaves green & white  
striated; sterile.



241146 *Paeonia lactiflora* Pall.

1 planted, persisting

2 47 *Lymphocarpus albus* var.  
abundant *laevigatus*  
(7 cm. 28 lbs)1 48 *Dianthus barbatus*  
rare*Salix rigida*  
Aug. 4 - Hone Quarry  
on steep wooded rocky  
slope2 49 *Galium latifolium* Michx.  
common1 50 *Galium circaeazane* Michx.  
rareon steep wooded alluvial  
bank above stream1 51 *Galium lanceolatum*  
occasional1 52 *Hedyotis purpurea* v. *tennifolia*  
common.large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
abundant erect  
shoots, corollas  
campanulate, rose pink.  
fruiting shoots dead.

## PLANTS OF VIRGINIA

Locality	Occurrence	Date	Coll.	No.	Remarks
			Carol E. Fosberg		



- 21146 *Paeonia lactiflora* Pall.  
planted, persisting
- 2 47 *Lymphocarpus albus* var. *laevigatus*  
abundant (7 cm) black
- 1 48 *Dianthus barbatus*  
rare

*Delphinium*  
spp.

2 49 *Nicotiana glauca* L.

1 50 *Nicotiana glauca* L.

1 51 *Nicotiana glauca* L.

1 52 *Nicotiana glauca* L.

large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.

PLANTS OF VIRGINIA

Locality  
Occurrence  
Date  
Coll. Carol E. Fosberg  
Remarks  
No.



241146 *Paeonia lactiflora* Pall.

1 planted, persisting

2 47 *Lymphocarpus albus* var. *laevigatus*  
abundant (7 cm. 17 Blake)1 48 *Dianthus barbatus*  
rare

Collected Aug 4 - Hone Quarry rocky

2 Michx.

1 Michx.

vial  
m  
atum

venosifolia

large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
— abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.

## PLANTS OF VIRGINIA

Locality	Occurrence	Date	Collector	Remarks
			Carol E. Fothergill	No



- 41146 *Paeonia lactiflora* Pall.  
planted, persisting
- 2 47 *Lymphocarpus albus* var. *laevigatus*  
abundant (7 cm, 10 leaf)
- 1 48 *Dianthus barbatus*  
rare

12-14 - Horse Quarry  
rocky

in Michx.

2 Michx.

Eurol  
cam  
slatum

v. *tenuifolia*

large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.

# PLANTS OF VIRGINIA

Locality  
Occurrence  
Date  
Coll. Carol E. Fensholt  
Remarks  
No.



- 41146 *Paeonia lactiflora* Pall.  
planted, persisting
- 2 47 *Lymnophycarpos albus* var.  
abundant *laevigatus*  
(7 cm.) black
- 1 48 *Dianthus barbatus*  
rare

*Calceol  
lygnet*

2 49

1 50

1 51

1 52

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and Technical Society

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large clumps, much  
branched, 0.8 m. tall,  
flowers faded.  
abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.

# PLANTS OF VIRGINIA

Locality

Occurrence

Date

Coll. Carol E. Fosberg

Remarks

No.

dry

rich

sh

at

in

infolia



- 41146 *Paeonia lactiflora* Pall.  
planted, persisting
- 2 47 *Lymnophycarpos albus* var. *laevigatus*  
abundant (7 cm.) 2 Black
- 1 48 *Dianthus barbatus*  
rare

*Cultured  
by me*

2

1

1

1

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Charter and organized with the re  
and Technical Society

PACIFIC SCI

*Today*  
*Michs.*  
*Michs.*  
*ial*  
*in*  
*stem*  
*emifolia*

large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.

PLANTS OF VIRGINIA

Locality  
Occurrence  
Date  
Coll. Carol E. Fosberg  
Remarks  
No



2/146 *Paeonia lactiflora* Pall.  
1 planted, persisting

2 47 *Lymnophyes albus* var. *laevigatus*  
abundant (Fern.?) Blake

1 48 *Dianthus barbatus*  
rare

Collected  
by  
2  
1  
1  
1

Today

Michx.

Michx.

rial  
m  
atum

lennifolia

large clumps, much  
branched, 0.8 m. tall,  
flowers faded.  
- abundant erect  
shoots, corollas  
campanulate, rose pink.  
fruiting shoots dead.

## PLANTS OF VIRGINIA

Locality  
Occurrence  
Date  
Coll. Carol E. Foberg  
Remarks  
No.



4/14/66 *Paeonia lactiflora* Pall.  
planted, persisting

2 47 *Lymnophyes albus* var. *laevigatus*  
abundant (7 cm. 2 black)

1 48 *Dianthus barbatus*

Calculus  
lypod

2 49

1 50

1 51

1 52

dry

rich

rich

rich

rich

rich

large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoot dead

## PLANTS OF VIRGINIA

Locality

Occurrence

Date

Coll. Carol E. Forberg

Remarks

No.



4/14/60 *Paeonia lactiflora* Pall.  
planted, persisting

2 47 *Lymphocarpus albus* var.  
abundant *laevigatus*  
(Fernald) Blake

1 48 *Dianthus barbatus*

Collected  
Eggs

2

1

1

1

Today

Michx.

Michx.

ial  
m  
tum

emifolia

large clumps, much  
branched, 0.8 m. tall;  
flowers faded.  
abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead

## PLANTS OF VIRGINIA

Locality

Occurrence

Date

Coll. Carol E. Foshare

No.

Remarks



4/14/6 Paeonia lactiflora Pall.  
planted, persisting

2 47 Lymnophycarpos albus var.  
abundant laevigatus  
(Tenn.) Blake

1 48 Dianthus barbatus

Collected  
type

2

1

1

1

Today

Michx

Michx

ial

in  
Lum

unifolia

large clumps, much  
branched, 0.8 m. tall;  
flowers faded.  
- abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.

# PLANTS OF VIRGINIA

Locality  
Occurrence  
Date  
Coll. Carol E. Fosberg  
Remarks  
No.



241146 *Paeonia lactiflora* Pall.  
planted, persisting

2 47 *Symphoricarpos albus* var.  
abundant *laevigatus*  
(7 cm. 7) 1960

1 48 *Dianthus barbatus*

*Endlicher*  
*1960*

2

1

1

1

Today

Michs.

Michs.

ial

on  
turn

conifolia

large clump, much  
branched, 0.8 m. tall;  
flowers faded.  
- abundant erect  
shoots; corollas  
campanulate, rose pink.  
fruiting shoots dead.



241146 *Paeonia lactiflora* Pall.  
1 planted, persisting

2 47 *Lymphocarpus albus* var. *laevigatus*  
abundant (7 cm.) Black

1 48 *Dianthus barbatus*  
rare

*Calceol. lyoni* Aug. 4 - Hone Quarry  
on steep wooded rocky slope

2 49 *Galium latifolium* Michx.  
common

1 50 *Galium circaeazane* Michx.  
rare

on steep wooded alluvial  
bank above stream

1 51 *Galium lanceolatum*  
occasional

1 52 *Hedyotis purpurea* v. *tennifolia*  
common.

large clumps, much  
branched, 0.8 m. tall;  
flowers faded.  
- abundant erect  
shoots; corollas  
~~campanulate~~, rose pink.  
fruiting shoots dead.



Aug. 5 - Spruce Knob Lake,  
 in mixed woods on  
 gentle slope

41157

*Thelypteris noveboracensis* (L.) Presl  
 common

Aug. 5 - s.e. slope Spruce Mountain  
 Pendleton Co.

Tall  
typical

in dense maple-birch forest  
 on bouldery slope

3 58

*Galium triflorum* Michx.  
 common

59

*Cuscuta rostrata* Shuttlew. ?  
 local, parasitic on various  
 herbs.

Tall  
typical

Aug. 5 - n.w. slope Spruce Mountain  
 Pendleton Co.

2

60 *Monarda didyma*

large colony in open along road

Low  
typical

Aug. 5 - top of Spruce Knob,  
 Spruce Mountain, Pendleton Co.  
 in irregular scrub with  
 scattered small pines

2

61 *Vaccinium angustifolium*  
 var. *nigrum* (Wood) Pohl  
 abundant locally

ctd. p. 170

prostrate to ascending.

stems yellow to orange;  
 corolla white, scales  
 white, half as long as  
 corolla, corolla lobes recurved,  
 style divergent from  
 thick stylopodium, stigmas  
 globose, yellow.

erect, corollas scarlet,  
 bract and calyx dark red.

low shrub, leaves  
 bluish green, paler  
 beneath; fruit black  
 sweetish.



Aug. 5 - Spruce Knob

rounded top of bedded rock, mostly broken into slabs and fragments, covered by a dense, locally open scrub about 1 m. high of *Menziesia pilosa* and a few other shrubs, openings filled by 2 sp. *Vaccinium* in full fruit.

Scattered through this are small spruces, singly or in small groups, 3-5 m. tall. Some areas mostly bare rock esp. on west side. Spruces get taller and closer together on east slope.

*Dennstaedtia punctilobula* local in small openings abundant in disturbed area around tower.

On west rim, just above open bare slab-rock slope are marked shallow wind grooves. The ridges of bushes between them each sheltered by a small spruce. Grooves 2-3 m. wide 1 m. deep lined with *Menziesia* & *Vaccinium* extending in 15-30 m.

Some open tundra-like area with dense *Cladonia*, depressed *Vaccinium*, scattered bushes.

# List of plants

- 4860' -
- c *Picea ~~mexicana~~ rubens*
  - a *Menziesia pilosa*
  - c *Acer ~~spicatum~~ rubrum*
  - o *Ilex montana*
  - lc *Dennstaedtia punctilobula*
  - lc *Lycopodium annotinum*
  - c *Lycopodium obscurum*
  - c *Epilobium angustifolium*
  - l *Rumex acetosella*
  - l *Solidago squarrosa?*
  - c *Cornus canadensis*
  - c *Trillium undulatum?*
  - a *Vaccinium angustifolium* <sup>var. *canadense*</sup>
  - a *Vaccinium angustifolium* <sup>var. *microcarpum*</sup>
  - lc *Ganthornia compressa?*
  - c *Dicentra eximia*
  - c *Diervilla lonicera*
  - n *Carex*
  - n *Ribes* sp.
  - o *Pyrus americana*
  - o *Betula alleghaniensis*
  - c *Vaccinium ~~sp.~~ erythrocarpum*
  - c *Aster acuminatus?*
  - n *Lycopodium clavatum*
  - lc *Carex* sp.
  - lc *Cypripedium acaule*
  - la *Pteridium aquilinum*
  - lc *Polypodium vulgare*
  - l *Aralia hispida*
  - o *Rubus* sp. (*flagellaris?*)
  - n *Rhododendron roseum*
  - n *Clintonia borealis?*
  - (*Heeracium pratense* (around tower))



Labeled typical

- 41162 *Vaccinium angustifolium* var. *laevifolium* House.  
abundant
- 2 63 *Picea rubens*  
abundant locally
- 2 64 *Lycopodium clavatum* L.  
occasional
- 2 65 *Cladonia*  
abundant between rocks
- 2 {66 *Menyanthes filosa*  
67 *Menyanthes filosa*  
dominant in scrub
- 2 68 *Polypodium vulgare*  
occasional between rocks
- 2 69 *Aralia hispida*  
very local <sup>synthyrocarpum</sup>
- 2 70 *Vaccinium* ~~laevifolium~~ <sup>synthyrocarpum</sup> Druff.  
very common
- 2 71 *Rhododendron roacum* (Lindl.) Rehd.  
rare
- 2 72 *Lycopodium annotinum*  
var. *acrifolium* Fern.  
occasional
- 2 73 *Lycopodium obscurum* v. *laevifolium* (L.) L.  
common
- 2 74 *Cornus canadensis* L.  
common

Aug 6 - Greenbrier Valley  
1 mi. n. e. of Bantow, Pocahontas Co.

- 4 75a *Monarda fistulosa* var.  
roadside in flat cultivated  
valley bottom.

low shrub, fruits  
bright blue, <sup>with heavy bloom</sup> sweet.  
small tree about 5-6 m.  
tall.  
creeping, fertile branches  
and cones erect

shrub 1 m. tall, leaves  
glaucous beneath,  
variable in size.

erect.

shrub up to 0.8 m. tall;  
leaves strongly reticulate  
beneath; fruit immature.

erect shrub 1.7 m. tall;  
leaves glaucous beneath.  
~~occasional~~ creeping,  
fertile branches erect.

fruit vermillion.

erect stems from  
underground rhizome



Labeled  
Sp. 182

1900 West Virginia

Aug. 6 - Spruce Knob  
Maple forest, badly  
cut over, with abundant  
*Crataegus*.

411753 *Crataegus* ~~sp.~~ *fecunda* var.?  
common

Aug. 6 - Gatewood Tower (USFS)

This ridge covered  
by cutover beech forest.  
Some red and sugar maple.  
*Betula alleghaniensis*, *Prunus*  
*serotina*

3 76 *Fagus grandifolia* var.  
dominant in low, thick  
second growth forest

Aug. 6 - Allegheny Mts. east of  
Thornwood, Pocahontas Co.

1 77 *Monotropa uniflora*  
abundant in deep  
leaf litter in maple forest

Similar to  
Aug. 7 - Gandy, ~~Santa~~  
Gandy Creek, Randolph Co.

1 78 *Oenothera*  
rare in grassy meadow on  
limestone slope.

Aug. 7 - 2 m. below Spruce Knob  
Lake, Randolph Co.

3 79 *Betula alleghaniensis*  
in cutover mixed woods

on gentle to moderate  
slopes, not very rocky.  
Soil that weathers  
deeply, forming soil.  
small tree, fruit green.  
nutlets placed on inner surface.

4200'  
1310 m

Very little herb growth -  
some *Dryopteris* *spinulosa*  
and other ferns, *Monotropa*  
*uniflora*. No *Epipagus* seen

spreading, much-branched  
tree 7-8 m. tall, bark  
~~to~~ gray-brown; fruit  
not quite mature.

white.

petals yellow.

tree 10 m. tall. bark grayish  
yellow.



Aug. 7 Gandy River Cave  
 a very muddy cave  
 opening just below road  
 at Gandy sink, on steep  
 curve. Two sp. millipedes,  
 1 cave cricket seen. Well  
 inside, perhaps 1-200 m.  
 and around curves, a  
 deposit of debris with  
 some *Fagus* nut shells  
 and other fruit coats,  
 probably dropped from  
 above by an animal.  
 No opening visible above,  
 but narrow crevice  
 goes far up. Water of  
 a small stream flows  
 into cave and dis-  
 appears down a hole  
 some distance in.

At Gandy sink a  
 fair sized creek (Gandy  
 River?) flows into  
 a hole in the mountain  
 said to reappear on  
 other side.

*alnifolium*, *Betula alleghaniensis*  
 spruce seedlings, *Fagus*,  
*Acer ~~spicatum~~* *spicatum*.

Ground cover of *Dennstaedtia*,  
*Athyrium*, *Oxalis montana*,  
*Dryopteris "spinulosa"*

4445'

Aug. 8 - Gaudineer Knob  
 flat top covered by dense  
 spruce forest about 210 m  
 tall, trees 9-15 cm. dbh.  
 spaced.

with a very few *Betula*  
*alleghaniensis*. A few  
 scattered *Kalmia latifolia*.  
*Rhododendron maximum*  
 in forest. small opening  
 with *Kalmia* and birch.

Ground covered by a  
 layer of moss up to  
 0.5 m thick. *Monotropa*  
*uniflora* scattered  
 on this, mostly white  
 but some with pink  
 stems. More abundant on moss.

Stumps and logs  
 scattered in this forest  
 up to 5 dm. thick, well rotted.

Toward edges the spruce  
 opens up, spaces filled with  
*Kalmia* scrub.

*Kalmia* and *Rhododendron*  
 just finishing flowering.

Virgin spruce area - scattered  
 100' spruces on gentle slope  
 with large yellow birch,  
 sugar maple, smaller ones  
 between and in openings.

Undergrowth varies from  
 median thick to sparse, of *Viburnum*



*Small  
typical*

Aug 7 Spruce Knob Lake

in marshy ground around  
edges of artificial lake

411 80 *Vaccinium vacillans* var. *crinitum* Fern.?  
common locally under spruces

4 81 *Galium tinctorium* L.  
common

2 82 *Viburnum cassinoides*  
occasional

2 83 *Glyceria canadensis* (Michx.) Trin.  
abundant in a <sup>narrow</sup> band ~~around~~ edge  
of lake in water

Aug. 8 - Gaudineer Knob

1 84 *Monotropa uniflora* L. aff. f. *rosea* Torr.  
occasional, with white  
form, in dense spruce forest

Aug. 8 - 1 mile north of  
Gaudineer Knob

in almost virgin mixed  
spruce and beech-maple forest.

2 85 *Carex intumescens* var. *fernaldii* Bail.  
rare along trail

1 86 *Tiarella cordifolia*  
common in marshy  
place below spring

(but leaves not glaucous beneath)

low spreading bushes,  
fruit blue.

— stems weak but erect;  
flowers white

— shrub 1.5 m. tall.

— fruit green.

— culms erect, panicles  
drooping.

stems pale pink,  
flowers white.

— small tuft, culms  
ascending.

in dimensional characters  
approaching *T. wherryi*, but  
stoloniferous.



(from p. 194.) Many fallen rotting logs. Locally quite a few cut stumps, perhaps only near trail.

Locally spruces are closes and form groves with some large hardwoods.

Soil a yellowish loamy gravelly sand, with mor layers of varying thickness. Great blocks of pebbly sandstone or quartzite scattered through area, locally abundant up to 3 x 5 m x 2 m.

The "virgin spruce" area is, acc. Forest Service sign, 130 acres. Average ht. of trees 100', average age 250 years, largest diameter 35".

Surrounded by beech-maple forest that above badly cut-over, that below very nice.

Aug. 9 - Bickle Knob - forest on top of knob around fire tower is about an equal mixture of *Quercus rubra*, *Prunus serotina* and *Acer rubrum*.

Stuart Recreation Area, on Shavers Fork River, east of Elkins.

- a *Picea rubens*
- a *Betula alleghaniensis*
- c *Fagus grandifolia*
- c *Acer nigrum* var. *glabrum*
- o *Acer spicatum*
- n *Acer pensylvanicum*
- n *Ilex montana*
- lc *Lycopodium lucidulum*
- a *Viburnum alnifolium*
- n *Carex*
- lc *Rubus*
- a *Oxalis montana*
- a *Hennataedtia punctilobula*
- o *Athyrium filix-femina*
- o *Dryopteris "spinulosa"*
- l *Polypodium vulgare* var. *virginicum*
- l *Clintonia*
- lc <sup>in</sup> *Thelypteris*
- lc <sup>man</sup> *Arisaema* (not *atrorubens*)
- ec <sup>spot</sup> *Trillium* or *Whittella*
- lc *Carex radiata*?
- n *Pantheria compressa*? (rare)

fine mixed deciduous forest with  
*Liriodendron tulipifera*  
*Oxydendrum arboreum*  
*Quercus alba*  
~~*Carya*~~  
*Magnolia ~~acuminata~~ fraseri*  
*Quercus velutina*  
*Q. coccinea*  
*Acer rubrum*, *Q. nigrum* Id. p. 192



fruits  
typical

Aug. 9 - Stuart Recreation Area,

in mixed deciduous forest  
on dissected wall of  
river ravine

41187 *Thelypteris hexagonoptera* (Michx.)  
very local flow.

2 88 *Galium lanceolatum*  
local

Aug. 10 - Laurel Mountain  
5 mi. n. w. of Elkins, Randolph Co.

3 89 *Galium latifolium* Michx.  
occasional in rather thin  
second-growth hardwood  
forest on rather stony slope

1 90 *Botrychium dissectum*  
rare in second-growth  
hardwood forest on gentle slope Barbours.

1 91 *Galium circaejanum* Michx.  
rare in dense hardwood  
forest on rather steep slope

Robtbaugh Blains,

Aug. 11 - Ridge north of Dolly Sods.  
near Bell Knob Tower

3 92 *Lycopodium annotinum*  
common in open tall scrub on quartzite

93 Robtbaugh Blains,

Aug. 11 - Ridge n. of Dolly Sods,  
1 mi. n. of Bell Knob Tower

3 913 *Vaccinium myrtilloides*  
very common in ericaceous  
scrub on quartzite

~~creeping~~ stems ascending

stems ascending.

stems ascending.

creeping, branches erect.



Understory of *Cornus florida*,  
*Nyssa ~~acuminata~~ sylvatica*,  
*Rhododendron maximum*.  
*Kalmia* common. Ferns  
 and especially *Lycopodium*  
*complanatum* <sup>and *Gaultheria*</sup> very  
 abundant on ground.

Trees 15-20 m. tall, up to  
 4 dm. dbh.

Rohrbach Plains,  
 Aug. 11 - ridge to north of  
 Dolly Rods, boundary between  
 Tucker and Grant Cos. Bell  
 Knob Tower is along ridge  
 2 miles N. of Dolly Rods.

A broad flat-topped ridge,  
 the top sloping gently to the  
 west. Top covered by scrub  
 varying from low compact  
*Vaccinium* etc. to a mixture  
 of *Prunus serotina*, *Ilex montana*,  
*Ases pennsylvanicum*, *A. rubrum*,  
*Betula alleghaniensis*,  
*Rhododendron maximum*,  
*Pyrus americana*, *Amelanchier*  
*sp.*, etc. with scattered  
*Picea rubens* slightly  
 taller than the rest. The  
 whole quite dense, varying  
 from 2 m. to 4 m. tall.

The *Prunus* may be *P. pennsylvanicum*.  
 The *Rhododendron* flowering.  
 This around Bell Knob Tower. 417  
 Ground of quartzite slabs.

Tygart Lake State Park,  
 Taylor Co. (also Barlow Co.)

Considerable areas of  
 second-growth woods  
 on high ground around  
 reservoir, some of it  
 fairly mature, mostly  
 rather young, *Liriodendron*  
 very abundant.

Low scrub 2 miles or so north,  
 mostly *Gaylussacia baccata*,  
 some *Vaccinium*, about 2.4-0.5  
 m. high, with scattered  
 taller bushes of *Kalmia*  
*latifolia*, *Menziesia pilosa*,  
*Amelanchier*, *Prunus pennsylvanicum*,  
*Pyrus americana*, a few taller  
*Betula alleghaniensis* and  
 spruce. *Gaultheria* on ground,  
 also *Maianthemum*.

*Nemophanthus* rare.

Ground of quartzite slabs.  
 To north or west knob alternating  
 low dense <sup>dwarf scrub</sup> *Gaylussacia* and  
*Vaccinium* with rocks  
 patches of irregular  
 mixed scrub of *Kalmia*,  
*Menziesia*, *Sambucus racemosa*,  
*Pyrus americana*, *Nemophanthus*,  
*Ilex montana*, etc. *Prunus*, *Amelanchier*  
 with low *Vaccinium*.  
*Potentilla tridentata* common  
 in low dwarf scrub, *Rubus* sp. (matted).



*Lycopodium tristachyum*,  
*L. clavatum*, *L. obscurum*  
 var. *dendroideum*. *Cladonia*  
*solidago* spp. in dwarf scrub.  
 In some areas *Danthonia*  
*compressa* is dominant  
 with only local patches  
 of dwarf scrub. These areas  
 seem more soil-covered,  
 but to be suffering from  
 surface erosion.

Aug. 28 - Bull Run Mts  
 summit ridge near  
 Tower, on a slabby shaly  
 ridge of quartzite, dipping  
 sharply east. Soil accum-  
 ulated in crevices and  
 irregularities.

Almost closed forest  
 about 10 m. tall, dominated  
 by *Quercus prinus*, with  
 some *Pinus virginiana*  
 and *Quercus velutina*,  
 a little *Carya*. Trees  
 10-20 cm diam.

An irregular shrub  
 layer, mostly *Kalmia*,  
 1-2 m. tall, locally  
 very sparse. Locally dense.

An almost complete  
 dwarf shrub layer 1-4 dm  
 high of *Vaccinium vacillans*  
 etc.

- c *Quercus velutina*?
- a *Quercus prinus*
- c *Pinus rigida*
- o *Carya* sp.
- a *Vaccinium vacillans*
- c *Kalmia latifolia*
- bc *Sparganium angustifolium* v. *angustifolium*
- bc *Chimaphila maculata*
- o *Sassafras albidum* (sapling)
- bc *Galusaria baccata*
- o *Castanea dentata* (sprout)
- c *Acer rubrum*
- o *Quercus marilandica*
- a *Pinus echinata*?
- a *Gaultheria procumbens*
- a *Lycopodium vulgare* var. *virginicum*
- a *Cypripedium acaule*
- bc *Smilacina racemosa*
- l *Carex* sp.
- o *Vitis* sp.
- o *Juniperus horizontalis* (spp.)
- o *Rubus* sp.
- a *Hemerocallis* sp.



Labels  
typed

Aug. 11 Ridge n. of Dolly's  
about 4 mi. n. of Bell Knob Tower  
~~low dwarf~~ low dwarf scrub

4/194

Melampyrum

occasional in open grassy phase

2

95 Potentilla tridentata

abundant locally in  
open grassy phase of

1

96 Hedysotis caerulea

common in open grassy phase

1

97 Lycopodium tristachyum  
local in area

Aug. 14 - Broad Creek, branch  
of South River, Anne Arundel Co.

Labels  
written

98 Naias flexilis (Willd.) Roth. &amp; Schum.

~~also~~ common locally  
with other water plants  
on muddy bottom, somewhat  
brackish water.

Labels  
written

Aug. 23 - Sleepy Hollow 1 mi. S. of

common in some shaded disturbed  
ground near parent trees

99

Pericandron tulipifolium L.

4/1900

Liquidambar styraciflua L.

01

Acer rubrum L.

Aug. 28 Bull Run Fire Tower

top of Bull Run Mts. Prince William Co.

1

Labels  
written

02

Spiraea betulifolia var. corymbosa  
common locally in scrubby  
forest on quartzite ridge

flowers white with  
yellow mouths.

petals white.

corolla lavender with  
yellow eye

creeping, rhizome  
buried; herbage bluish green

seedlings



Aug. 30 - Great Falls of the  
Potomac

noted flowering

*Andropogon gerardi*  
*Cassia marilandica*  
*Laportea officinalis*  
*Euphorbia corollata*  
*Cyperus lancastricensis*?  
*Asclepias verticillata*  
*Aster linifolius*  
*Helianthus* sp. (tuberous?)  
*Lespedeza cuneata*  
*Silphium*? (lvs. ternate,  
gray, few, narrow)  
*Ambrosia artemisiifolia*  
*Coreopsis* (trifoliate lvs.)  
(All of above on rocky  
area near lookout, below fall.)

Sept. 4 - same

additional noted flowering in  
picnic ground

*Aquatic*  
*Lespedeza*  
*Juncus tenuis*  
*Elephantopus carolinianus*?  
*Desmodium* sp.  
*Plantago rugelii*  
*Muhlenbergia schreberi*  
*Hedeoma pulegioides*  
*Oxalis*  
*Lobelia inflata*  
*Prunella vulgaris*  
*Solanum nigrum*  
*Acalypha*

*Rechtites bicaricifolia*  
*Paronychia canadensis*  
*Panicum boscii*  
*Eupatorium coelestinum*  
*Lactuca* (tall, pale fl.)  
*Solidago juncea*?  
*Impatiens capensis*  
*Lactuca* (blue fl., entire lvs.)  
*Trifolium virginicum*  
*Ambrosia artemisiifolia*  
*Panicum clandestinum*?  
*Apocynum tuberosum*  
*Trichostema*

additional noted flowering id. to quarry

*Digitaria ischaemum*  
*Boehmeria cylindrica*  
*Carula virginica*  
*Stylosanthes*  
*Graphalium obtusum*  
*Eupatorium rugosum*  
*Heterotheca inaequalis*  
*Lactuca* (low, yellow, entire lvs.)  
*Desmodium* sp.  
*Rudbeckia hirta*  
*Erigeron ~~strigosus~~ strigosus*  
*Collinsonia canadensis*  
*Pycnanthemum*  
*Polygonum sagittatum*  
*Galium*



19 200

Labels ignored  
labels written

Virginia

Sept. 4 - Great Falls of the  
Potomac

41203

*Lespedeza*

common in disturbed

semi-wooded picnic ground

04

*Galium triflorum* var. *asprelliflorum* Fern.

very local along old wood road

prostrate, flowers rose color.

prostrate, forming  
loose mat.



